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Patriotic Duty of Buyers

BY R. DAWSON HALL

FINANCIAL troubles and lack of work arise in general from the inactivity of buyers, who make up their minds that prices are high and may soon drop, and then fold their hands and wait for the drop to come. As a result business drags till their prognostication proves true or false. Usually, however, if enough buyers wait, wages and prices actually do fall so as to make the delay profitable to the individual, though quite frequently he suffers more in the collapse that follows than he gains by the decline in price.

So far this delay has been regarded as justifiable except in the matter of labor purchases. A delay in buying labor on the part of an employer is known as a lockout, and is, in general, looked upon as being morally indefensible. Mines and manufactories may be closed down if the operation is unprofitable, or if the product cannot be sold, but it is considered reprehensible to close them down merely for the purpose of making the worker take less for his labor.

In this instance, then, we have ruled that the buyer has a duty to go on buying. He is not allowed to seek a reduction in the price of labor by closing down, but on the other hand he is permitted to refuse to buy the product of labor and thus cause all manner of idleness in the hope of lowering the price of the product and incidentally the wage rate. Eventually, we may class both actions as equally reprehensible, for they have the same result.

We may regard the conspiracy to refuse to buy goods, when that refusal is made for the purpose of lowering the price of the goods, as being morally as bad as a conspiracy to refuse to sell them, when that refusal is made for the purpose of raising the price above the market.

In law doubtless the conspiracies are equally illegal, but in common acceptance the attempt to lower a price by combination or by abstention from purchase is almost never considered wrong;

and the law against it as a conspiracy is not pressed. The public has yet to be made to learn that there is a moral wrong done to the nation every time a man or a group of men delay purchases of material for which they have an actual need. Just what are the duties of the buyer cannot perhaps be set forth in black and white, but it is well for us to take a glimpse at his duties just at the present when conditions are so poised that a few days of inconsiderate and needless abstention from a patriotic duty may wreck the whole financial structure.

In the medieval era the buyer was quite generally a lord and the seller almost always a serf. From these earlier and simpler times we have inherited a viewpoint which gives us little respect for the seller and his rights. Nevertheless he should not be denied trade at the whim of the buyer nor, on the other hand, should he be berated by the would-be purchaser if he fails to supply in a few days on the demand of the buyer what the buyer, had he been reasonably forehanded, could, just as readily, have arranged to receive in installments spread over a period of months.

Patriotism demands of us all at this time that we buy what we want without unnecessary delay. It is well known that there is plenty of demand for labor and material, and any let up in work now must be followed by feverish anxiety to produce later. Why then have a slack period? Rather let us advocate as a patriotic duty, in so far as may be feasible, that "Business as usual" be the motto of the nation.

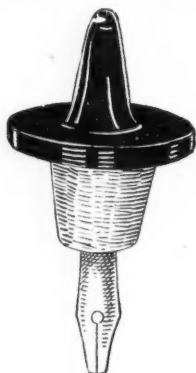
At any time a determination of the buyers to abstain from buying will wreck the market and cause immense distress. By his inconsiderate action the man who abstains from buying is almost as likely to hurt himself as others. Seldom is it advisable and never is it patriotic to hold off from such purchases as we would make at once if we were assured that the price would remain stationary.

IDEAS AND SUGGESTIONS

"Tip" for the Ink Bottle

BY J. A. LUCAS
Ozone Park, N. Y.

In many drawing rooms the draftsmen use small ink bottles that are frequently refilled from the larger ones in which the ink is purchased. These small bottles are thus used for a long time, and the quill which is attached to the stopper becomes soft, and sometimes

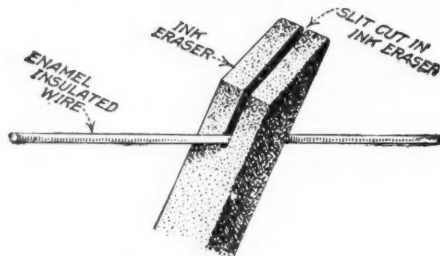


PRACTICAL FILLER FOR INK BOTTLE

is broken, so that it will not reach to the bottom of the bottle. The broken quill may be cut off close to the cork and a large stub pen inserted so that the point will reach the bottom of the bottle when the stopper is in place. After this change has been made the filler will be found to give as good service as a new one and in addition will last considerably longer.

Removing Enamel Insulation from Wire

A scheme for removing the enamel insulation from small magnet wires without the aid of a knife, and one that has been found to work out satisfactorily, is shown in the accompanying illustration. Where this plan is



DEVICE REMOVES INSULATION FROM WIRE

used it is only necessary to cut a slit with a penknife in an ink eraser and then rub the eraser to and fro along the wire in different positions. This removes the enamel and does not nick the copper. It is not desirable to use a knife for this purpose because it will nick, mar or scratch the wire.

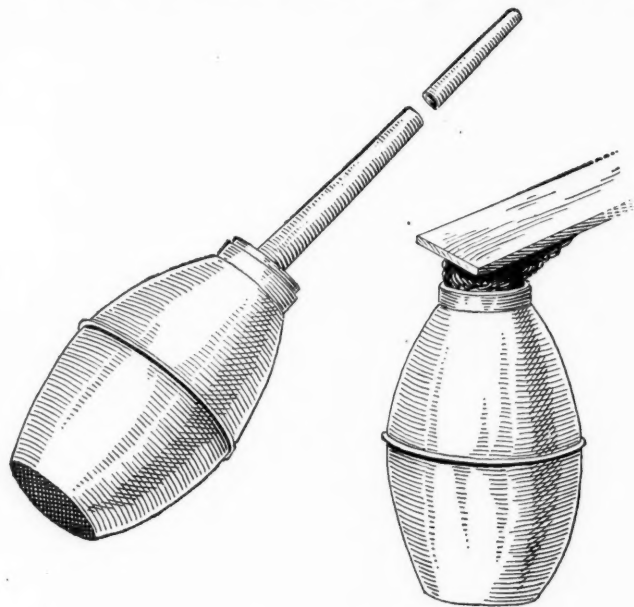
Material Needed in Mine Rescue Work

After many a mine disaster no progress can be made in recovery work without reestablishing the ventilation. For this purpose much material may be needed. Some authority at the mine should at once arrange for the quick delivery of a supply of brattice cloth or canvas and 1-in. planks. Near-by mines and sawmills should be notified to send as quickly as possible such material as may be available. Mine supply stores should be reached by telephone and asked to forward at once by the quickest available method a supply of canvas or brattice cloth. The necessary timber for the support of stopings is usually on hand at all mines; it may consist of props, ties and wooden rails. Saws, nails, hatchets and hammers should be provided in abundance. —*Rescue and Recovery Operations in Mines.*

Grease Cup Filler

BY ERNEST SCHWARTZ
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Filling grease cups in places difficult of access and those on certain machine parts is often a tedious operation, which always necessitates waste of the lubricating material. To overcome this, the device shown in the accompanying illustration will be found practicable. It



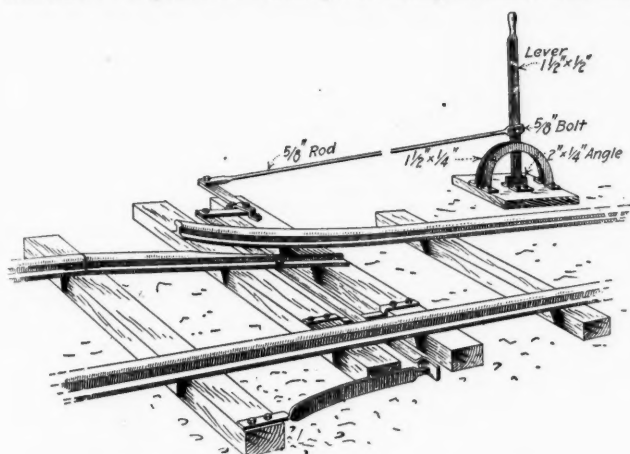
EASILY MADE GREASE GUN

can be made at a small cost. A rubber bulb is fitted with a brass or copper tube of any length desired. The bulb can be purchased in any drug store. The operation of filling the bulb with grease is shown in the right-hand sketch. Graphite compositions and oils can be quickly and successfully handled in large quantity by this method.

Simple Derailing Device

By J. W. POWELL
Nanaimo, B. C.

The derailing device shown in the accompanying illustration has been installed at the head of the slopes at Cassidy, B. C. It has proved to be simple and positive in operation and absolutely reliable at all times. In addition to a head block, which is placed on top of the knuckle and which in itself satisfies the requirements of the Coal Mines Act, the device shown was placed in operation as an additional precaution in the interest of safety. The device is placed just below the knuckle at a point sufficiently far away to allow for the



SIMPLE AUTOMATIC DERAILING DEVICE

taking up of the slack in the rope, all couplings and the rope being taut before they reach the derailing switch.

The switch operates automatically when the trip ascends, working back and forth with the aid of the spring as the cars pass over it. This actuating spring is a leaf from an ordinary wagon spring. When the trip descends, the rope rider holds the lever, which is located on top of the slope that closes the switch, until the trip passes over it. He then releases the lever, when it returns to the safety position, as shown in the drawing. This contrivance is cheap and simple and can be installed in a few hours when the parts are completed. In fact the trip was held up only 30 minutes when the changes were made. In general it should be installed between shifts, after hoisting is through for the day.

Liberty Coal

Everyone realizes that the coal mines are short of miners and other help, and that the country needs all the coal that can be mined. An idea is being tried at a mine in Johnstown, Penn., that has every indication of being a success. Many day men are necessary in the operation of a large mine, and all of them are anxious to make as much money as possible. The company in question has therefore set apart a few rooms that are being cut by a chain machine and the track laid by day men. The props are also set and the coal shot by day men. Every night two men who are willing to work this extra shift as coal loaders are detailed to each place. They receive the same wages as other loaders at a set rate of so much per ton or are paid by the average car.

This plan gives extra shifts to any day men who

want to load coal and help the situation as it exists at present. I think that there are quite a few day men who would gladly take this means of helping out the country and increasing their earnings. This idea can be used at all mines where the setting aside of certain rooms will not decrease the output and where there are sufficient men to work at night or a few hours evenings to load the coal. It might also be adopted at mines where there are no machines. The men can in such a case both dig and load coal and get the pick price.

Alternating-Current Motor Trouble

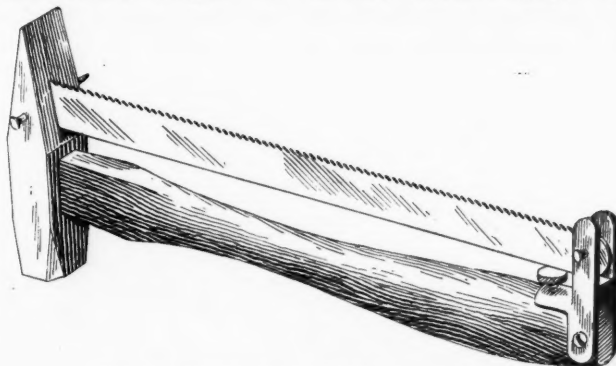
An alternating-current motor connected to a pump developed a hot spot on one of the coils. This hot spot was confined to a section of the coil about 2 in. long at the point of the connection. The motor ran all right. The hot spot seemed to attain a certain temperature, which it did not exceed, the rest of the coil remaining at a normal temperature.

The coils in this motor consisted of two No. 13 D. C. C. wires in multiple. The connections were examined and proved to be perfect. On removing the insulation from the coil at the point of heating, it was found that one wire of the start of the coil was partly shorted with one wire of the second turn of the same coil. The result was that the current was partly shunted around this one turn of the coil, causing the heating referred to. After raising the wires and reinsulating them at this point, the motor ran without heating the coil.

This is rather an odd case of trouble, as a shorted coil in an alternating-current winding generally results in that particular coil becoming red hot in a short time, burning off the insulation and causing damage to the other coils if the machine is permitted to run any length of time. The only remedy is to cut the coil out of the circuit, remove it from the machine, then reconnect the leads so as to bridge the gap caused by the removal of the coil.

Useful Combination Tool

An ingenious combination of a hacksaw and a cross peen hammer is shown in the accompanying illustration. This combination is not only advisable for the sake of convenience, but also to relieve the tool bag of unnecessary weight. It will also conserve space. In



COMBINATION HACKSAW AND HAMMER

construction the device is simple, and the illustration is self-explanatory. The hacksaw blade is adjusted by means of the setscrew, which will move the arm around the fulcrum and in this manner either tighten or loosen the blade.

Surface Plant of the Orient Mine in Franklin County, Illinois

Designed To Operate Under Varying Conditions of Transportation, the Orient Mine Holds the World's Hoisting Record of 6008 Tons in Eight Hours—The Operation Embodies Some of the Latest Mechanical Ideas

ALL manufacturers aim to turn out their product with the least expense consistent with the best results. The production of domestic and steam fuel should be no exception. An old coal operator once said, "The more valuable a ton of coal becomes to our customers the more in the end will be the producer's profit." Progressive operators today continue to work along such lines, as witness the fine million-dollar plants of the successful coal men of Franklin County, Illinois. The infinite pains taken to place a superior article on cars for shipment is told in the following description of one of the largest coal-preparation plants of southern Illinois; it was designed, constructed and equipped by some of the leading engineers, structural men and manufac-

turers. The Orient mine of the Chicago, Wilmington and Franklin Coal Co. is one of the largest and most successful in the Franklin County field. This mine holds the world's hoisting record of 6008 tons of coal per day of eight hours. Furthermore the week's output (from Oct. 7 to 12 inclusive) of coal hoisted, prepared and loaded for shipment was 32,514 tons. The run by days was—Monday 4928 tons, Tuesday 5237, Wednesday 5482, Thursday 6008, Friday 5355 and Saturday 5504, or an average of 5419 tons per day.

The average output was higher than any single day's output of any other mine in the southern Illinois field and the biggest day—6008 tons—is the largest single day's output heretofore reported for any coal mine in

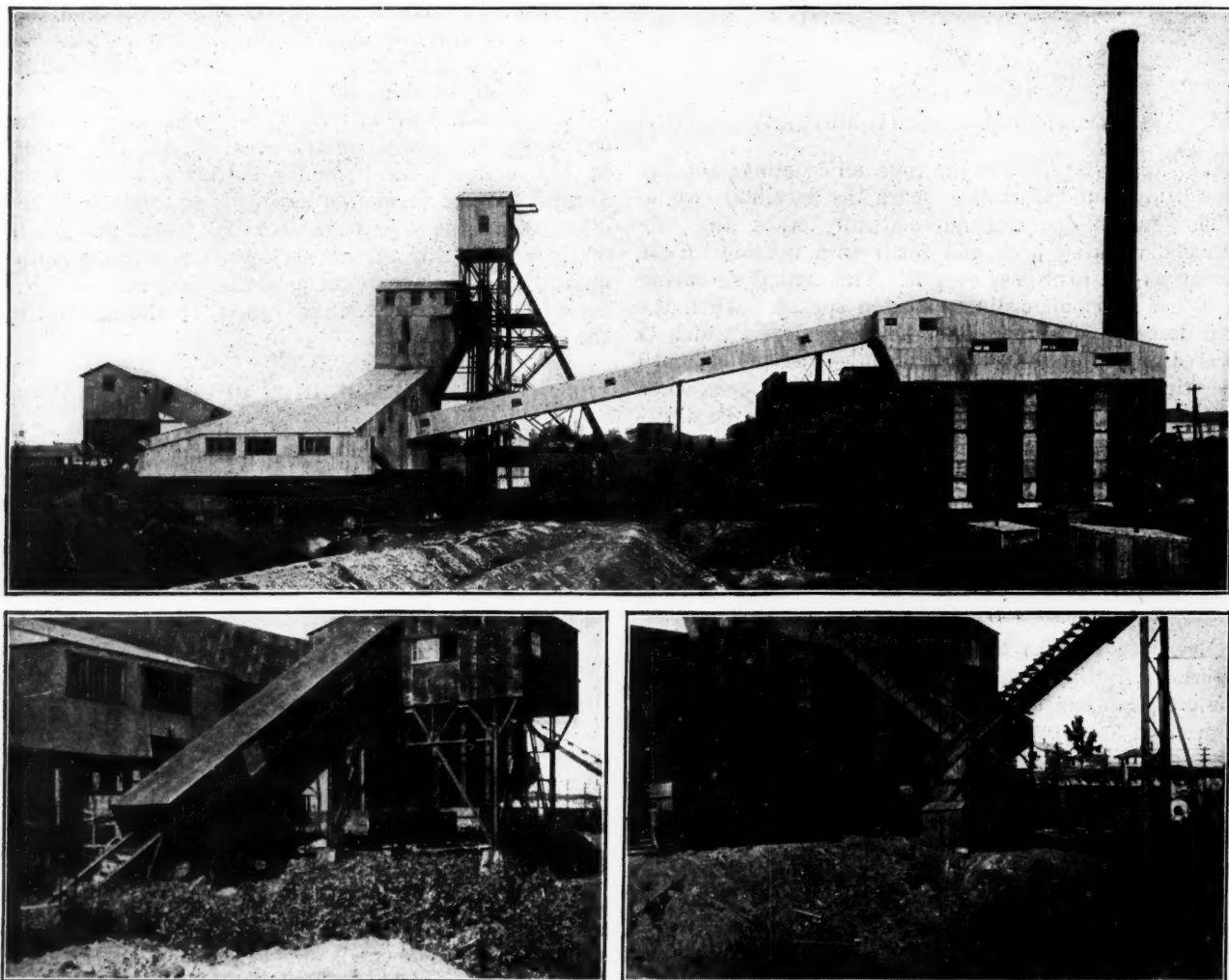


FIG. 1. GENERAL VIEW OF ORIENT TIPPLE AND RESCREENING PLANT—THE HEADFRAME AND ENGINE HOUSE IN THE CENTER

The small views at the bottom show recent additions to the tipple and the rescreener. Left, reprocessing plant in connection with the storage recovery system; right, rescreener overflow for stocking surplus screenings

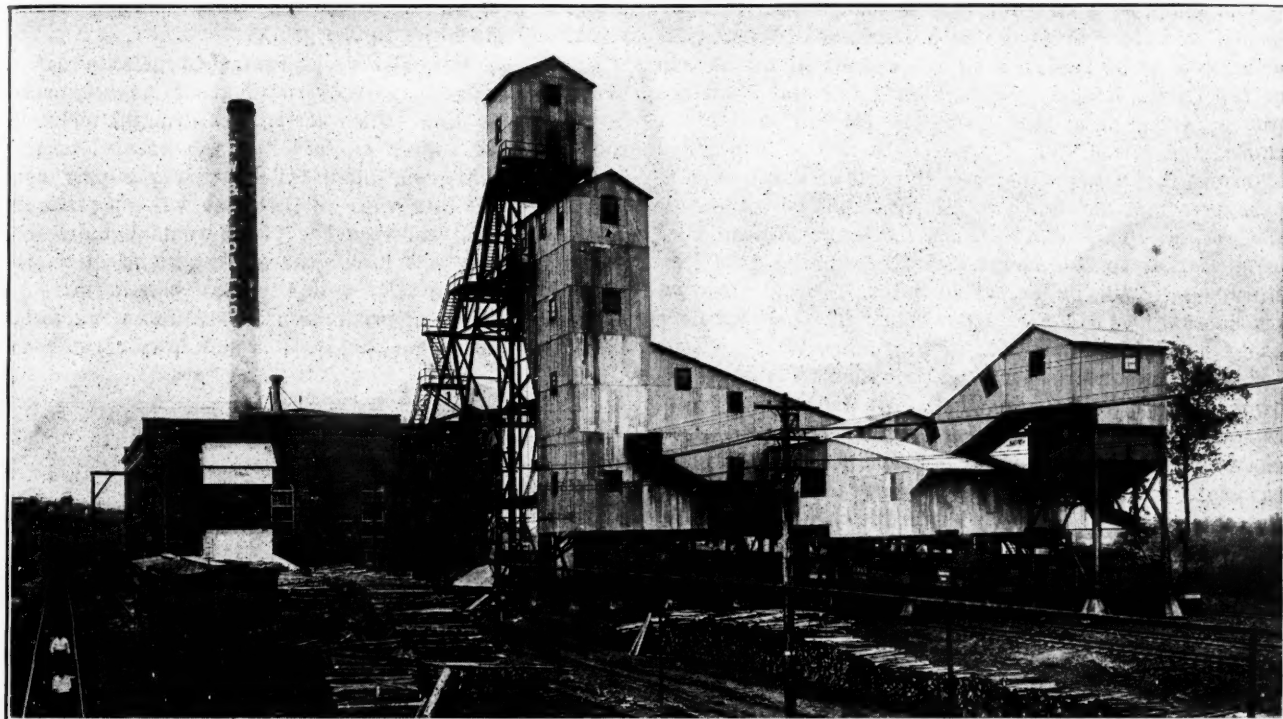


FIG. 2. VIEW OF ORIENT TIPPLE, HEADFRAME, AND ENGINE AND BOILER HOUSE

any field—a splendid achievement. To raise the 6008 tons on Thursday, it was necessary to make 1452 hoists or an average of $181\frac{1}{2}$ hoists per hour; this is a little better than three per minute all day. The mine cars average somewhat better than four tons of coal each.

As evidenced by the comparatively large output on Wednesday and Friday, there was no unusual preparation for a big daily record drive by having extra coal on the bottom, and so on, nor was there any unusual let down on the day following. The record was stated to be "simply the result of a day's run in which there were practically no delays in any department of the operation—738 men reported for work on this day." The comment in quotation marks is the modest reference, on the part of the Orient mine's management, to a record which coal men will recognize as the result of intelligent planning from the inception of the mine to such a time as the mine and tipple development reached proportions permitting this most unusual movement of coal from face to railroad car. A number of other factors also enter into this problem such as the driving force of those responsible for results at the mine and the character of the men cutting and loading the coal. The slacker board at the Orient mine might also furnish some interesting information.

During the month of October, 1918, 132,411 tons of coal were hoisted at Orient. If this monthly record is the average for the year, the annual tonnage of this mine would amount to 1,588,932 tons—an achievement which should be closely approached judging from recent performance. In this connection reference is made to production information given in an article descriptive of the underground workings of the Orient plant in the Aug. 22, 1918, issue of *Coal Age*.

The surface plant at this mine is distributed about the main shaft. Views of the main structures in this group are shown in the accompanying illustrations. The

tipple, which is built for large tonnage production, is presented in Figs. 1 and 2 from different points of view. As the coal is dumped from the Olsen cages at the top of the headframe it is discharged into the tipple. Here it is either loaded as run-of-mine or it is screened and made into the sizes commonly prepared in Illinois. The separation into the seven different sizes takes place in the tipple proper (the building at the left of Fig. 1) or in the rescreening house (shown at the right in Fig. 1). At times of uncertain car supply, run-of-mine or any of the prepared sizes may be stored and treated later, and loaded from the storage pile into railroad cars either for shipment or for reprocessing in the tipple.

Considering the preparation of the coal in detail, treatment starts when the run-of-mine is discharged into the bottom dump weigh pan at the top of the tipple. From this pan the coal goes to a reciprocating feeder which sends the coal uniformly to the screens. These shaking screens are 10 ft. wide and produce the regular sizes, according to Franklin County practice, over 6, 3 and 2-in. round perforations. Coal dropping through 2-in. round openings goes to the rescreening house. The three sizes made in the tipple proper are: lump (all coal passing over 6-in. round perforations), egg (drops through 6-in. and passes over 3-in.) and nut (goes over 2-in. round perforations). These three sizes are cleaned of impurities on the picking tables which are shown in Fig. 3; in this illustration men are at work picking out impurities which are taken up by means of a pan conveyor to a refuse storage bin. The refuse conveyor is the middle one of the three shown in Fig. 3; on either side are the conveyor picking tables for coal. The refuse storage bin is shown at the extreme left in Fig. 1; refuse is loaded into railroad cars from this bin and is thus carried for disposal to some point where it will not interfere with operations.

The lump, egg and nut coal is loaded into cars by booms to reduce breakage to a minimum. When run-of-mine is to be loaded, a gate is opened in the bottom of the feeder hopper, which diverts the coal from the screens (at a point just above the feeder) and into a chute; the lower end of this chute is the large pipe shown in Fig. 2 emerging from the side of the tippie and passing across and down to a loading point over a railroad track. This chute is used both for loading run-of-mine coal for shipment and for running coal into storage, as will be described later. On all loading tracks there is a car retarder made by the Fairmont Mining and Machinery Co., of Fairmont, W. Va. This arrangement permits each car trimmer to operate his own car as it is being loaded. All degradation from lump, egg and nut is carried by drag conveyor to an elevator which delivers to the rescreener belt or slack car; this belt conveys all coal dropping through the 2-in. perforations on the tippie screens to the rescreening house.

The rescreening house is shown at the extreme right of Fig. 1; it is of the latest type. In this building the screenings through the 2-in. perforations are treated and separated into four sizes. The rescreener is fed from the tippie by means of a 36-in. Stanley belt, made by the Stanley Belting Corporation, of Chicago, Ill. This belt runs on Stephens-Adamson ball-bearing rollers carried on an inclined covered bridge, which is shown in the center of Fig. 1, and which runs from the lower part of the tippie to the top of the rescreening house. The four sizes made here are nut No. 2, or stove (through 2-in. round perforations and over 1½-in.), nut No. 3 (through 1½-in. and over ¾-in.) nut No. 4, or pea (through ¾-in. and over ⅜-in.) and No. 5, or carbon (through ⅜-in. perforations).

The screening equipment consists of a four-deck, balanced steel shaking screen, suspended by board hangers and operated by double cranks with side arm connecting-rods. The screens are operated by a 15-hp. variable-speed motor; normally they run at 130 r.p.m., but they can be speeded up if wet coal is encountered or if an excessive quantity of small sizes comes up on the belt. The only size cleaned in this building is the No. 2 nut. Provision is made for this by having the lower end of the upper screen extended to form a picking pan where the impurities can be picked out. This refuse is taken to a bin at the end of the rescreener house shown in the small lower right-hand illustration in Fig. 1. This bin has a capacity of one carload. Under the rescreener house are the coal-storage pockets or bins; each bin holds 150 tons of coal, which is loaded out over a lip screen. The degradation is carried by a conveyor into the boiler house.

MOTOR DRIVES SOMETIMES PROVE ADVANTAGEOUS

A pertinent thought comes up in connection with the motor drives which operate the shakers, scraper and elevator lines about this plant. Individual drives have been advocated for years, and in many cases this is the only practical solution. However, where machines naturally arrange themselves in groups about a plant, a motor drive for each group is thought to be an advantage by some. A number of machines tend to have a flywheel effect on a motor drive. The effect of an overload on one machine or of another discontinuing oper-

ation is neutralized by the balancing tendency of the remaining machines in the group.

About two years ago it was decided to install a ground overflow storage and recovery plant of large capacity at the Orient mine. Such action was brought about by the uncertain supply of cars and the great losses in operation consequent upon failure of car supply at a time when the men were in the mine. It was thought that a storage and recovery plant would equalize car supply and prevent losses through shutting down the mine in the course of a day's run. Furthermore, it should equalize coal production on account of variation in the market demand. Such a plan was carried out

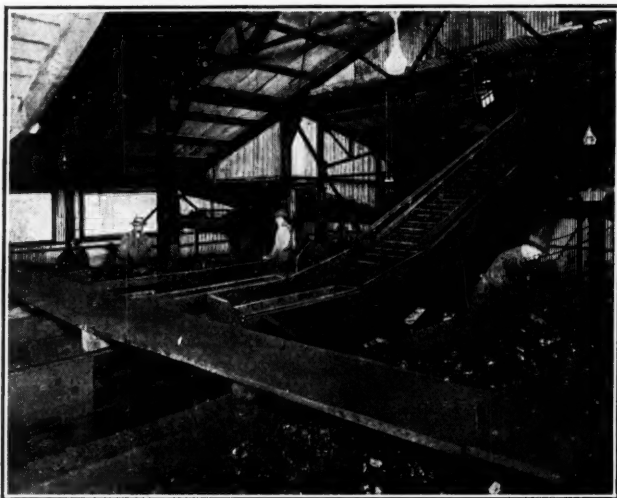


FIG. 3. INTERIOR OF PICKING SHED AT TIPPLE OVER LOADING TRACKS

and involves three distinct operations: First, ground storage, by which mine-run coal or lump, or for that matter any size of coal is run out into the storage pile. Second, a recovery system by which the coal can be picked up and loaded either into railroad cars as mine-run or be taken back and reprocessed in the main tippie. Third, rescreener overflow by means of which the raw screenings can be wasted in a stock pile on the ground and afterward be recovered and reprocessed over the main screen or in the rescreener house.

In carrying out the first operation, or ground-storage part of the plan, a low trestle was built on a piece of flat land about half a mile down the track from the shaft. This trestle is about 1000 ft. long and 10 ft. high. The company then purchased twenty side-dump cars made by the Western Wheeled Scraper Co., of Aurora, Ill.; also two Link-Belt locomotive cranes, equipped with 2-yd. clamshell buckets. The dump cars have a capacity of 25 tons each. These cars are run under the chute at the tippie and filled with mine-run coal, then a train load is taken by the yard engine to the trestle and dumped, after which it is returned to the tippie. The cars are run in two trains so that one train can be under the tippie all the time. When the capacity of the trestle is reached, the locomotive cranes rehandle the coal and pile it within reach of their booms.

In this way it is possible to store coal as rapidly as it is being produced at the mine, so that the plant can be operated without slowing down the operation. The storage yard is shown in Fig. 4; the trestle is on the left

and the crane is shown at work rehandling the coal, taking it from the trestle and piling it to the right.

The second feature, or the recovery system, is planned for a smaller hourly capacity than the storing of coal in the storage yard. It is limited first by the capacity of the crane which loads the coal directly into railroad cars, and second by the capacity of the reprocessing plant, by means of which the coal is conveyed to the shaking screens again. The reprocessing plant is shown in the small bottom illustration to the left in Fig. 1. In case the coal at the storage yard is to be reprocessed, it is loaded back into the side-dump cars; these cars are moved to a point just above the tippie and then dropped by gravity on a special track to the reprocessing plant. The cars in this train of loads are now dumped, one by one, into a hopper at the side of the track. This hopper has an apron feeder in the bottom which delivers the coal to a short inclined conveyor; this in turn delivers to another and longer inclined conveyor running at right angles to the first conveyor line. These inclined conveyors are shown in the small bottom left-hand illustration in Fig. 1. The upper end of the short conveyor ends at a platform; the other and longer conveyor starting at this platform and running to a point above the feeder, discharging through a chute onto the same and thence onto the shaking screens again. This reprocessing installation is so arranged that the conveyors and feeder can be run at speeds to deliver between 50 and 500 tons of coal per hour. It is the practice of the company to keep these conveyors running at slow speed while the coal is being hoisted from the mine, so as to permit the conveyor coal to mix with the product from the mine on the shaking screens. Then in case of any temporary stoppage of hoisting, the conveyors are speeded up and the whole

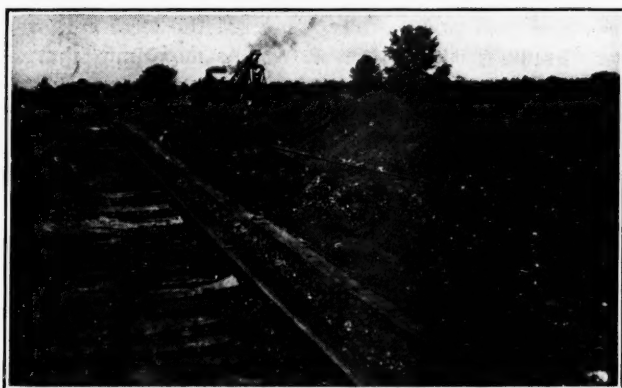


FIG. 4. COAL-STORAGE PLANT AT ORIENT—TRESTLE AT LEFT AND RELOADING CRANE AT THE TOP

capacity of the screens can be delivered for a short time, thus equalizing the operation of the tippie.

The third feature is the overflow from the rescreener house. The rescreener house is shown at the right in Fig. 1; the overflow feature is depicted in the small illustration at the bottom and at the right of Fig. 1. The overflow is arranged as follows: A chute receives the screenings from the tippie as this coal is discharged from the long inclined belt conveyor at the top of the rescreener house. The chute delivers the screenings to an inclined conveyor (the lower part of this conveyor is shown in the small illustration in Fig. 1) which stocks the coal in a conical pile on the ground across the tracks

from the rescreener house. This overflow chute can be placed in operation by simply opening a flap gate in the discharge from the conveyor at the top of the rescreener house, thus diverting the coal to the overflow apparatus. The coal can be recovered from the stock pile at any time, the locomotive crane loading it into side-dump cars; these cars may then dump the coal into the hopper of the reprocessing plant, which delivers it to the tippie shaking screens again.

RESCREENER OVERFLOW PROVES VALUABLE IN OPERATION

The special value of the rescreener overflow arises from the fact that the rescreener house pockets, or bins, occasionally get full and it is impossible to unload them without blocking the loading tracks. This overflow also enables the company to bypass the rescreener in case of car shortage; thus enough cars might be provided to take care of the main tippie whereby the lump, egg and nut would not be sent to the storage yard.

During these days it is customary to publish the names of "honor men" and firms connected with a worthy piece of work. In the case of the Orient plant, the original tippie structure was designed and built by the Wisconsin Bridge and Iron Co., of Milwaukee, Wis. The machinery in the original installation was furnished by the Scottdale Foundry and Machine Co., now the Marion Machine, Foundry and Supply Co., of Marion, Ind. The new installation in connection with the tippie was planned and the work was done in the field by the Allen & Garcia Co., of Chicago, Ill. The machinery was furnished by the Jeffrey Manufacturing Co., of Columbus, Ohio, the Stephens-Adamson Manufacturing Co., of Aurora, Ill., and the Skillin & Richards Manufacturing Co., of Chicago, Ill. The new rescreening plant was designed by the Allen & Garcia Co. and the steel work furnished and erected by the Wisconsin Bridge and Iron Co. The field work was done, aside from the steel erection, by the Allen & Garcia Company.

Among the other features of the plant is the Nordberg hoisting engine (made by the Nordberg Manufacturing Co., of Milwaukee, Wis.), which is the finest in the field. It is a 28 x 54-in. engine and was equipped last year with a cylindro-conical drum; the small diameter of the drum is 7 ft. and the large diameter 11 ft. This change in the drum has been the means of increasing the output of the shaft by at least 700 tons per day. Furthermore, the balancing of the hoist is so greatly improved by means of the conical drum that the engine is controlled and operated at a higher rate of speed than formerly, with much greater ease and safety and with a considerably greater steam economy. The latter feature is especially noticeable as the mine was often short of steam when hoisting with the old 10-ft. cylindrical drum. The hoisting cycle is such that more than three cars per minute can be handled constantly with a total hoist of about 600 ft. and a rope speed of about 4500 ft. per minute. The cylindro-conical drum installation was planned and executed by the Allen & Garcia Co. working in connection with the Nordberg Manufacturing Company.

In the same room with the hoisting engine is the electrical power plant, which includes a 350-kw. Nordberg-Corliss direct-current unit and a 500-kw. Fulton engine unit. The Fulton engine is made by the Fulton

Engine Works, Los Angeles, Cal. Power generated by these sets is used to operate the underground haulage, the mining machines and to run the surface machinery exclusive of the hoist. There is also a 65-kw. set furnishing current for lights. In the same building with the hoist and the generators is the steam power plant; it is of ample dimensions and capacity, and contains six 400-hp. Wickes vertical tube boilers, made by the Wickes Boiler Co., of Saginaw, Mich. The boilers are fired mechanically, being equipped with Green chain grate stokers, made by the Green Engineering Co., of East Chicago, Ind. The smallest sizes of coal are burned on these grates and it is conveyed to the boiler house hoppers, from which it is fed by gravity to the stokers.

The big brick stacks which are such a feature of the Franklin County field mark the location of plants as

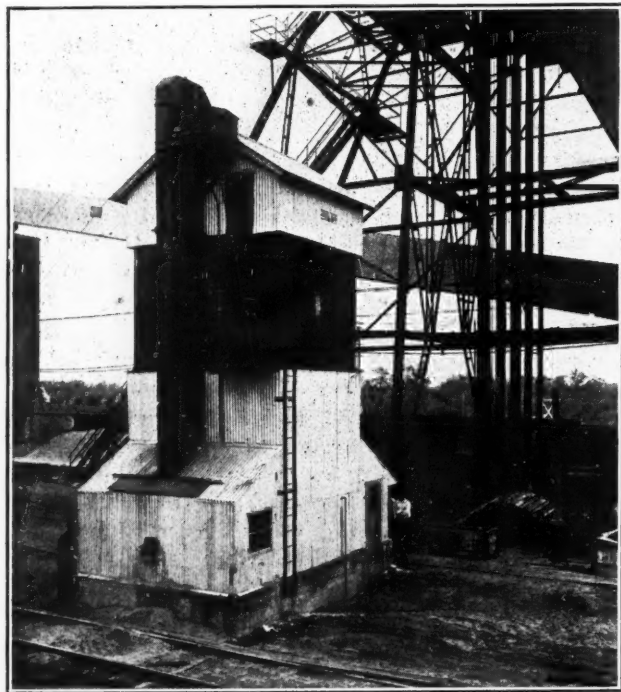


FIG. 5. SAND-STORAGE AND DRYING PLANT AT ORIENT MINE

far as the eye can reach on all sides of Orient. The 175-ft. stack at this plant has an inside diameter of 8 ft. It is of Wiederholdt type (built by the Wiederholdt Construction Co., of St. Louis, Mo.) and is built of vitrified tile with honeycombed sections vertically. After the tile blocks are set, the sections are filled with concrete reinforced with rods which ties the whole construction solidly together.

There is a washhouse close to the main shaft with the usual equipment of lockers, hangers and sprays for 780 men. The washhouse was designed and built by the Allen & Garcia Company.

Water for the various needs of the town and plant comes from the Middle Fork of Big Muddy River. It is pumped by two centrifugals to a Booth water softener (made by the L. M. Booth Co., of Jersey City, N. J.) from which a boiler supply is sent to a 50,000-gal. tank as reserve storage.

This great preparation and coal-handling plant at Orient is noteworthy not alone for the excellence of the

mechanical equipment but also for the comprehensive scheme for balancing the operation of the plant in the many emergencies which can be counted upon to arise during a year's or even a month's run. It also reflects the optimism as well as the foresight of the management. It has taken years to plan this operation, construct the plant and bring the underground development to the point where there is enough "coal in sight" (to borrow an expressive term from our metal-mining friends) to guarantee a steady and reliable flow of big tonnage from the mine face to the screens at the tipple. There was great depression in the coal trade in 1911 and again in 1914-1915—nevertheless this development was vigorously prosecuted and today, when coal is needed, the plant is able to turn out quantity shipments. Emergencies have been quickly met and new requirements speedily provided for as reflected in the improvements recently added.

The facts in this description of the Orient plant came from the authoritative sources of the management of the Chicago, Wilmington and Franklin Coal Co. and the Allen & Garcia Co., the engineering and constructing firm. *Coal Age* is appreciative of such courtesies.

Coal Prices in Ireland

Shortage of shipping, high freights, and the increased cost of labor have resulted in the price of coal being raised in Belfast, Ireland, until it is about double what it was before the war. Despite the shortage of tonnage, local dealers managed to maintain the imports to Belfast at the necessary standard, and they were able to supply all the demands made upon them. The total imports of coal into Belfast for 1917 amounted to 1,321,434 tons, which exceeds the figures for the last prewar year by about 8000 tons. The Government took over the control of coal prices and empowered the local authorities to appoint committees to fix the maximum charge per ton for each district. Subsequently it was resolved that the maximum price of household coal should be fixed at \$10.95 per ton cash. Scheduled prices are being observed by making the charge of \$11.19 per ton for the best English coal, subject to a discount of \$0.243 for cash.

In exploration and recovery work at a mine following a disaster, the code of hoisting engines in general use should be followed. Copies of this code should be posted at the top of the shaft and be furnished the men who descend the shaft. If the regular signal devices have been destroyed, other methods of signaling must be improved. It is not safe to rely on any pipe running down the shaft, as it may be broken or entirely absent a short distance down. Hammers may be used for striking the bucket, or a triangle or short piece of T-rail may be suspended over the bucket or on the cage or float and be struck with a hammer. Two or more hammers should be taken, as one may be accidentally dropped into the shaft. Automobile horns may be heard in shallow shafts 200 ft. deep. A No. 8 wire may be used to advantage for signaling. The wire should be cut 10 ft. longer than the depth of the shaft, and the upper end should be attached to a counter-weighted bar of iron that will strike a suspended plate or circular saw when pulled.—*Rescue and Recovery Operations in Mines.*

Fans and Boilers

By W. D. OWENS

West Pittston, Penn.

SYNOPSIS—*The results of tests conducted upon mine fans were taken as a standard by which the capacities of similar fans used to furnish forced draft to boilers was determined. The amount of air thus calculated is then compared with the quantity required for complete combustion of the fuel used. The results showed some surprising air velocities and in one case resulted in the modification of the baffling.*

A SPECIAL test was made some time ago on two ventilation fans, and their efficiencies used as a guide to the probable efficiency of blast fans used in connection with boiler plants. This was done because of the difficulty in measuring correctly the quantity of air entering a blast fan, owing to the short air passage into this machine, and the whirling motion of the air entering the fan. While on this subject, I think it might be of considerable interest, since we know the tonnage of coal consumed at a boiler plant, to know also what quantity of air is necessary to be furnished each minute, so as to obtain the best results from the fuel consumed. We thus learn that there is a practical limit to the velocity of the gases traveling from the firebox into the stack.

The first ventilation fan tested was 20 ft. in diameter and 6 ft. 8 in. wide, with the blades bent forward in the direction of rotation of the fan. This machine running at 72 r.p.m. produced 113,850 cu.ft. of air per minute and developed a 1.2-in. water gage. The cubical contents in which this fan revolves at the above-stated speed = $20^2 \times 0.7854 \times 6.66 \times 72 = 150,070$ cu.ft. (Small fractions in all the calculations in this article will be omitted, when possible, for the sake of simplicity). And the theoretical water gage for this speed will be $20 \times 3.1416 \times 72 = 4524$ ft., peripheral speed per minute, or

$$\frac{4524}{60} = 75.4 \text{ ft. per sec.}$$

Therefore, assuming the average temperature to be about 60 deg. F. (which was approximately true when the test was made in the return airway), we have

$$\frac{75.4^2 \times 0.0765 \text{ (the weight of air)}}{32.16 \times 5.2} = 2.60 \text{ in. of water gage}$$

The percentage of mine water gage to the theoretical water gage equals $\frac{1.2}{2.60} = 46.15$ per cent. This shows that this fan cannot produce a large volume of air except when the air resistance is low.

Now, deducting the mine water gage from the theoretical water gage, we have 2.60 in. — 1.2 in. = 1.40 in. water gage. This pressure is consumed in the fan itself in forcing through it the 113,850 cu.ft. of air handled. Any fan should produce its own cubical contents when revolving in the open atmosphere and not connected in any shape or form with the mines or any other air duct; under such conditions the volume

of air enters direct from the open atmosphere into the fan, and is thrown out by the blades in motion again into the atmosphere and the theoretical water gage is entirely consumed within the fan itself to force out this volume of air.

Assuming that all fans of this type or model are able to produce their own cubical contents per revolution, determine how much air a fan will produce under any given conditions above or below such standard. The cubical contents of this fan, as stated heretofore, is 150,070 cu.ft., and the theoretical water gage is 2.60 in. Therefore, when 1.2 in. of water gage of this 2.60 in. was taken to force the air through the mines, and up to the fan, we have a balance of 1.4 in. of water gage, which forced 113,850 cu.ft. of air through the fan itself. Since 2.60 in. of water gage should produce 150,070 cu.ft., what quantity of air should 1.40 in. of water gage produce? We now have the following proportion:

As $\sqrt{2.60} : 150,070 :: \sqrt{1.40} : 110,153$ cu.ft. But this fan actually produced 113,850 cu.ft. Therefore,

$$\frac{113,850 - 110,153}{150,070} = 2.47 \text{ per cent.}$$

Hence, this fan is able to produce 2.47 per cent. above its own cubical contents per revolution when working against no head. The fan was built by the Vulcan Iron Works, Wilkes-Barre, Pennsylvania.

SECOND FAN TEST

The second fan was a new one, built about two years ago by the Vulcan Iron Works, and, upon request, was furnished with straight or radial blades, bending neither forward nor backward. The fan was 24 ft. in diameter and 8 ft. wide, and ran at $72\frac{1}{2}$ r.p.m. It produced 171,500 cu.ft. of air per minute, developing 2.40 in. mine water gage. The cubical contents of this fan at the above velocity equals $24^2 \times 0.7854 \times 8 \times 72.5 = 262,377$ cu.ft. and at this speed the wing tips traveled $24 \times 3.1416 \times 72.5 = 5466$ ft. per minute, or

$$\frac{5466}{60} = 91.1 \text{ ft. per sec.}$$

Hence the water gage would be

$$\frac{91.1^2 \times 0.0765}{32.16 \times 5.2} = 3.79 \text{ in.}$$

Now, 3.79 in. — 2.40 in. of mine water gage = 1.39 in. of fan water gage. This represents the pressure necessary to force 171,500 cu.ft. of air through the fan itself. Hence, the percentage of mine water gage to the theoretical water gage is as follows:

$$\frac{2.4}{3.79} = 63.32 \text{ per cent.}$$

Therefore this is a better fan to develop pressure and volume than the preceding one. Now, what quantity of air should this fan produce, based on its cubical contents? We have as follows:

As $\sqrt{3.79} : 262,377 :: \sqrt{1.39} : 158,840$ cu.ft. Since the fan actually produced 171,500 cu.ft., we have 171,500

— 158,840 = 12,660 cu.ft., above its own cubical contents, or

$$\frac{12,660}{262,377} = 4.82 \text{ per cent.}$$

It can be seen that this fan is a good one, and proves clearly the fallacy of having the blades of any fan bent either forward or backward as compared with the motion of rotation. It also proves that a fan can be depended upon to displace its own cubical contents, when the theoretical depression produced is entirely consumed within the fan itself. Therefore, the efficiency of a fan can be clearly calculated on the foregoing principles, if the purchaser will state the capacity of the machine when there is no resistance to be overcome. Of course, the temperature must be taken into consideration; but, under identical conditions the volume of air produced will be the same.

The gases resulting from the complete combustion of coal in air should not contain less than 16 per cent. of carbon dioxide gas. For, whenever the flue gas contains less than this amount, it is evident that too much air is allowed to pass through the furnace. Even on the basis of admitting one-third more air into the firebox than is theoretically necessary for complete combustion, the escaping gases should contain from 20 to 22 per cent. of carbon dioxide.

The molecule of carbon dioxide, or CO_2 , is composed of one atom of carbon with an atomic weight of 12, and two atoms of oxygen with an atomic weight of

16. Hence, $\frac{2 \times 16}{12} = 2\frac{2}{3}$. Therefore, to convert 1 lb. of carbon into carbon dioxide requires $2\frac{2}{3}$ lb. of oxygen when complete combustion takes place. The composition of the atmosphere being made up of 23 per cent. of oxygen, by weight, and 77 per cent. of nitrogen, by weight, it is clear, since we need $2\frac{2}{3}$ lb. of oxygen from the atmosphere, that we must accept 8.94 lb. of nitrogen with it; for, as $23 : 2\frac{2}{3} :: 77 : 8.94$. Hence, to complete the combustion of 1 lb. of carbon we must consume 11.61 lb. of air ($2\frac{2}{3} + 8.94 = 11.61$). Now, since 1 cu.ft. of air weighs 0.0765 lb. at a temperature of 60 deg. F. (which is a fair average), we have to furnish $11.61 \div 0.0765 = 152$ cu.ft. of air for every pound of carbon consumed.

BEST PRACTICE CALLS FOR MORE AIR

This, of course, is the theoretical quantity necessary, but the best boiler-room practice calls for from one-third to one-half more air in addition. We will assume that an addition of one-half is admitted. Thus $152 + 76 = 228$. Therefore, for every pound of coal burned (assuming that every pound of coal contains 100 per cent. carbon) it requires about 228 cu.ft. of air to pass through the firebox.

In all probability the coal consumed under the boiler does not contain more than about 80 per cent. of carbon, but when we take into consideration the quantity of oxygen and hydrogen it also contains, which averages about $7\frac{1}{2}$ per cent. according to the geologists, Rodger and Johnson, every pound of coal consumed under ordinary boilers will be fully equivalent in heating capacity to a fuel containing about 90 per cent. carbon. Hence, $228 \times 0.90 = 205$ cu.ft., and this for convenience can be reduced to 200 cu.ft. of air that must be furnished for

every pound of coal consumed in order to secure sufficient oxygen for complete combustion to CO_2 . This combustion should develop $14,550 \times 0.90 = 13,095$, or say 13,000 B.t.u. of heat for every pound of coal thus consumed. But, if any of this combustible escapes in the form of CO, it must be remembered that not to exceed 4200 B.t.u. will be developed.

We will now consider the two separate boiler plants at Heidelberg No. 1 and Exeter collieries, and ascertain what quantity of air is necessary to be furnished to the boilers at each.

COAL CONSUMPTION AT HEIDELBERG COLLIERY

The Heidelberg No. 1 colliery power plant comprises four return-tubular boilers of 150 nominal horsepower each, and one battery of Stirling boilers of 300 hp., or a total of 900 hp. The coal consumed at this particular colliery averages about 1200 tons per month of 30 days, full time, or about 2,688,000 lb. This is equivalent to about $62\frac{1}{2}$ lb. per minute; and since no steam is necessary for 12 hours of each day, and 24 hours on Sundays, except for pumping and ventilation, it is evident that about one quarter more coal than the average amount must be furnished during the 12 hours on the operating days. Hence, we have $62\frac{1}{2} + 15.56 = 77.81$ lb. consumed every minute during the operating period. For convenience' sake, we shall call it here 75 lb. per minute. Hence, this plant must be furnished with $75 \times 200 = 15,000$ cu.ft. of air per minute.

As stated heretofore, this plant is composed of four return-tubular boilers each 6 x 18 ft. These each contain 76 four-inch diameter flues, through which the gases return to the stack. Now, since 15,000 cu.ft. of air is necessary per minute, each boiler-horsepower will require $15,000 \div 900 = 16.66$ cu.ft. of air per minute. Consequently, one return-tubular boiler requires $16.66 \times 150 = 2500$ cu.ft. of air per minute. This boiler contains 76 flues each with an internal diameter of 3.73 in. and, therefore, the cross-sectional flue area is equal to 5.76 sq.ft. Hence the velocity of the gases going through these flues, when the boiler is thus forced, equals $2500 \div 5.76 = 434$ lin.ft., nearly, per minute (omitting the amount of carbon combined, which in this case is about $1/18$ more). But since the average temperature of the return gases passing through the tubes cannot be less than about 1000 deg. F., this volume increases proportionately. Thus, as $0.0284 : 2500 :: 0.0765 : 6734$ cu.ft., and this latter figure divided by the area of the flues gives

$$\frac{6734}{5.76} = 1170 \text{ lin.ft. (nearly)}$$

velocity per minute, or about 19.5 lin.ft. velocity per second.

When the boilers are thus forced the resistance becomes so great, owing to the small area compared with the rubbing surface of the tubes, combined with the above-stated high velocity, that the vacuum created at the foot of the stack, arising from the difference in temperature between the escaping gases going through the stack and that of the outside atmosphere, is not sufficient to force out the necessary quantity. The result is that part of the air forced through the fire by the blast fan must blow out directly through the firedoors into the boiler-room proper, and into the face

of the fireman. This also prevents any fresh air from entering the firebox from the boiler room, which is highly desirable when fresh coal is fired because generally some of the gases leaving the fire escape in the form of CO, or carbon monoxide. A small quantity of fresh air entering the combustion chamber at such times reconverts the CO into CO₂. It is important to secure this result since complete combustion into CO₂ produces 14,500 B.t.u. of heat, while the combustion to CO develops only 4200 B.t.u. per pound of carbon consumed.

In order to furnish the aforementioned quantity of air and force it through the grates and other gas passages, the blast fan has to run at from 130 to 150 r.p.m. The diameter of the fan is 8 ft. and its width 3 ft. 2½ in. In one of the tests made the fan was running 130 r.p.m., producing a water gage of 0.6 in. The cubical contents of the space occupied by this fan is 160.8 cu.ft., and this times 130 = 20,900 cu.ft. The theoretical water gage for this speed is 1.338 in. Deducting from this the 0.6 in. actually produced leaves 0.738 in., as the water gage consumed in the fan itself. Therefore, to find the quantity of air this fan produces under the conditions of the mine fan test, we have the proportion $\sqrt{1.333} : 20900 :: \sqrt{0.738} : 15,500$ cu.ft. It was calculated, heretofore, that 15,000 cu.ft. of air was necessary to proper combustion at this plant, and taking into consideration the waste, this fan must be producing a little more than its cubical contents.

The Exeter colliery steam plant has two batteries of Babcock boilers of 300 hp. each, and three batteries of Stirling boilers of 463 hp. each, making a total of 1989 hp. The consumption of coal at this colliery averages about 4000 tons per month of 30 days, full time, or about 210 lb. of coal per minute. During the days when the mines are in operation this colliery again has to burn about one-eighth more coal than the average consumption. Therefore, we must add 26 lb. per minute, making a total of 236 lb., or say 230 lb., so as to be on the safe side of the ledger. Now, since we must use 200 cu.ft. of air per pound of coal, we have $230 \times 200 = 46,000$ cu.ft. of air that must be furnished through the fireboxes every minute. The horsepower of this plant, as previously stated, is equal to 1989.

Hence $\frac{46,000}{1989} = 23.12$ cu.ft. of air (nearly) per horsepower per minute.

One battery of Stirling boilers is equal to 463 hp., and $463 \times 23.12 = 10,700$ cu.ft., necessary for one battery. The passage into the stack, as originally constructed, was 1 ft. 5 in. by 15 ft., equals 21.25 sq.ft. Across this extends 30 water tubes, each 3.25 in. in outside diameter, thus cutting the effective area down to 9.75 sq.ft., through which the gases must pass in order to escape. The temperature of the gases at this point cannot be less than about 600 deg. F., or their weight will be about 0.0376 lb. per cu.ft. Since 10,700 cu.ft. is necessary at a temperature of 60 deg. F., or a weight of 0.0765 lb. per cu.ft., we have the proportion $0.0376 : 10,700 :: 0.0765 : 21,770$ cu.ft. Consequently, $\frac{21,770}{9.75} = 2230$ lin.ft. velocity per minute.

It was shown, when discussing the Heidelberg

return-tubular boilers, that the lineal velocity leaving the boilers was about 1170 ft. per minute; therefore, the velocity of the gases leaving the Stirling boilers at this colliery was unreasonable before the escape opening was enlarged. There is no wonder that the flames from the fireboxes were blowing out into the fireroom and into the face of the fireman.

The stacks are 5 ft. in diameter, or 19.635 sq.ft. in cross-sectional area. The area of the stack is the same in proportion as are the stacks used on the return-tubular boilers. These are 34 in. in diameter, or 6.30 sq.ft. in cross-section for a boiler of 150 nominal horsepower. Therefore, $150 : 6.30 \text{ sq.ft.} :: 463 : 19.44$ sq.ft., practically the same as the area of the 5-ft. diameter stack. There are dampers attached to these stacks, but they cannot be operated because the volume of the gases passing through the flue and stack is equal to the power of the vacuum developed between the temperature of the two atmospheres inside and outside. The stacks, even now, after the change in area, should be about 10 ft. higher.

The fan at this plant, when the test was made, was running 90 r.p.m. This machine is 14 ft. in diameter, 5 ft. 6 in. wide at the center and 4 ft. 9 in. at the tips of the blades. This gives a cubical content in which the fan is revolving of 800 cu.ft.; hence $90 \times 800 = 72,000$ cu.ft. of air. The machine developed 1.1 in. of water gage when the test was made. The theoretical depression at this velocity is 2 in. (nearly); therefore, the quantity of air this fan should produce is shown by the following proportion:

$$\sqrt{2} : 72,000 :: \sqrt{0.9} : 47,000 \text{ cu.ft.}$$

It was heretofore shown that this plant required 46,000 cu.ft. per minute, and considering the amount of waste that takes place in the ashpits the quantities agree closely.

It has been shown that the average velocity of the gases going through the flues of the return-tubular boiler was about 1170 ft. per minute, and that at such a rate the flames in the firebox blew out through the doors. This proves that the velocity should not be higher than about 800 ft. per minute whenever the ratio of the rubbing surface to the area of the passage is as 1 to 230. That is, the area of one flue in the 150-hp. return-tubular boiler is $3.73^2 \times 0.7854 = 10.927$ sq.in., and this multiplied by 76 = 830.45 sq.in., or 5.76 sq.ft. But the rubbing surface of these flues each being 3.73 in. in internal diameter and 18 ft. long, or 216 in., equals

$$\frac{3.1416 \times 3.73 \times 216 \times 76}{144} = 1335 \text{ sq.ft.}$$

And this divided by the area, equals

$$\frac{1335}{5.76} = 231$$

Therefore, the ratio is about 1 to 230.

The ratio of the rubbing surface to the area of passage in the Stirling or Maxim boilers is materially less than in the return-tubular type. Nevertheless, it is plain that the velocity of the gases leaving the boiler proper and entering the stack should not be higher than 1500 lin.ft. per minute.

Looking down into the flue passage of a Stirling 463-hp. battery, the flue area equals about 15 ft. by 3 ft. 2 in., or 47.5 sq.ft.; but this passage contains

120 water tubes each $3\frac{1}{4}$ in. in diameter, which occupy a space of about 6.91 sq.ft. Hence there remains about $47.5 - 6.91 = 40.59$ sq.ft., or say 40 sq.ft., as the true average free area. The rubbing surface is of about 36-ft. perimeter and an average length of 10 ft., or 360 sq.ft. This times three, since there are three batteries, makes 1080 sq.ft. The surface of each water tube equals

$$\frac{3.1416 \times 325 \times 120}{144} = 8.5 \text{ sq. ft.}$$

This times 120 tubes equals 1050 sq.ft., and this multiplied by three makes 3150 sq.ft. of rubbing surface in the water tubes. Hence, we have $3150 + 1080 = 4230$ sq.ft. of total rubbing surface.

It was shown heretofore that when 2500 cu.ft. of air was forced through the grates of a return-tubular boiler, that the flames would blow out through the fire-doors quite forcibly; and that if the whole amount of this air was to go through the flues the velocity would reach about 1170 ft. per minute. This would indicate that the velocity should not exceed about 800 ft. per minute; or say 2200 cu.ft. per minute as the greatest quantity that should be furnished to a return-tubular boiler of this size. Hence, the quantity that should go through the passages of a 463-hp. Stirling boiler will be directly as the ratios of the areas and inversely as the square roots of the rubbing surfaces. These proportions are as follows:

Direct 5.76 : 2200 :: 40 : 15270 cu.ft.

Inverse..... $\sqrt{4230} : 15270 :: \sqrt{1335} : 8600$ cu.ft.

Since writing the foregoing, I find that the average length of the water tubes in the Stirling boilers is about 12 ft., and the quantity of air would thus be proportionately less, owing to the greater resistance, so that instead of 8600 cu.ft., it could not be more than about 7000 cu.ft., while it was stated previously that 10,700 cu.ft. was necessary. It is evident, therefore, that either the area of the passage had to be made much larger, or the boiler stacks would have to be made much higher, which of course would accomplish the same result.

Now, however, since the dimensions of the first and second baffle openings have been enlarged, and 7 in. added at the outlet into the stack, no flames are blowing out through the firedoors when the boilers are forced and the steam pressure can be kept higher and more constant.

Minecdotes

Getting a Bit of Their Own Back

In the earlier days of the war, before the seriousness of the outcome was recognized as it is at the present time, the shortage of coal and the scarcity of labor with which to mine it was hailed with outspoken pleasure by the employees of a certain small mine who had hitherto shown no great discontent with their lot.

"They," meaning the capitalists, of course, "have

been putting it all over us every which way for years, and right here is where we get a bit of our own back," was the sentiment generally expressed; while a few of the more knowing ones insisted that "some of those fellows must be getting kind of hard up for easy money, else there'd have been no war; and it's up to us to get our share while we've the chance."

This simply meant that instead of loading only clean coal, for which they were paid good wages, rock, bone, slate and anything black enough which came along were all loaded in together. Naturally, the reputation of the mine began to suffer, and the management were at their wits' end to know how to cope with the situation, since dismissal as a means of discipline was useless in the face of the difficulty they had to replace the men who left.

Finally, a bright idea occurred to the pit boss, who began to keep a sharp lookout on the cars, ordering the dirtiest to be dumped in a place conveniently handy for loading when required. A hard cold snap coming on about that time, it wasn't long before quite a rush of orders came in from the company's own men, and these were filled from this dump.

The grouching and grumbling and general all-round fussing that went on when the trick was discovered was met with bland astonishment by the management, who innocently inquired: "What did they want, anyhow? They were getting the same coal they had mined themselves, weren't they? If the stuff wasn't good enough to suit them, how did they expect other people to put up with it?"

A few weeks of domestic discomfort, short tempers, poorly cooked food and belated meals helped a little more to convince the men that "easy money" could be too dearly bought, and it wasn't long before most of them came round to a saner view of the matter when this side of the "getting-a-bit-of-their-own-back" question had been demonstrated.

Pride and Percy Verance

In one mine in West Virginia the miners are Welsh, Italian and Australian. Considerable rivalry exists between the several nationalities, but the Welsh hold the lead, beyond question. They are great coal miners; it seems to be born in the blood.

At the mine in question most of the work is contract, very little "company" work being done. One day the pit boss in making his rounds came upon two Welsh miners working at the face. It seems they were having a hard time, but were determined not to lay down. The pit boss asked how things were going.

"How goes it today, boys?"

"Pretty hard, boss; she sure is tough."

"Well, boys, perk up; all you need is pride and perseverance to keep you, and it will come all right." As he was walking back down the entry he heard the two miners stop working. He stopped and listened to the conversation.

"Say, Di, who is them fellows the boss was a-talking about?"

"I don't know. Who was he a-talking about?"

"That Pride and Percy Verance."

"Oh them! They must be the two wops on the night shift."

Research and Progress in Byproduct Coking in Great Britain—III

BY J. B. C. KERSHAW

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SYNOPSIS—*The refinement of benzol and the extraction of benzene, toluene and xylene, the three most valuable constituents, is an interesting process. Much care and careful control of temperatures must be exercised in this process in order to secure the best results.*

BENZOL is a term which, in byproduct coking practice, is used to cover a mixture of compounds of which benzene, toluene and xylene are the more valuable and important members, while certain sulphur compounds—paraffins, phenols, pyridine and naphthalene—are present as impurities. The recovery and rectification of benzol, therefore, is directed to recovering and obtaining in the pure state as large a quantity as possible of the three first-named carbon "ring" compounds from the coke-oven tar and gases.

It may not be out of place to note here that the benzol produced by the modern coke oven is derived from two sources—the tar and the gas. Prior to 1914, the larger portion of the benzol recovered came from the light-oil fraction of the tar distillate, but now the gas furnishes the greater amount.

As evidence of the rapid extension of the benzol recovery plants in the United States, the following figures from a report by C. E. Lescher, of the United States Geological Survey, may be quoted: In 1915 the output of benzol and other light oils by all the byproduct coking plants in the country was estimated

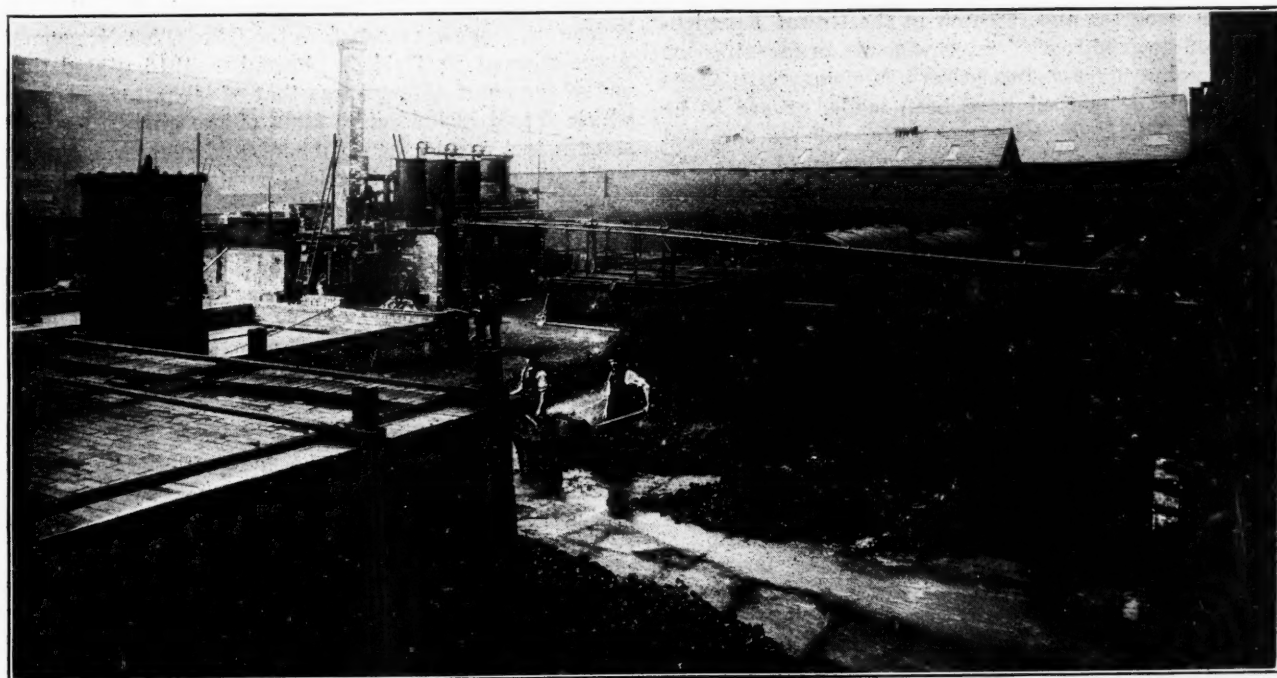
to be 13,942,763 gal., and only about one-half of this total was refined in the works where it was produced. From eight to nine million tons of coal were carbonized in the coke ovens that produced this light oil, and the 6,620,096 gal. refined at the byproduct coke works produced 4,833,939 gal. benzol, 1,315,727 gal. toluol and 470,425 gal. solvent naphtha.

Twelve months later the capacity of the benzol-recovery plants in operation in the United States was estimated to be 20,000,000 gal. per annum; while at the present time it is considerably over this amount—probably approaching 30,000,000 gallons.

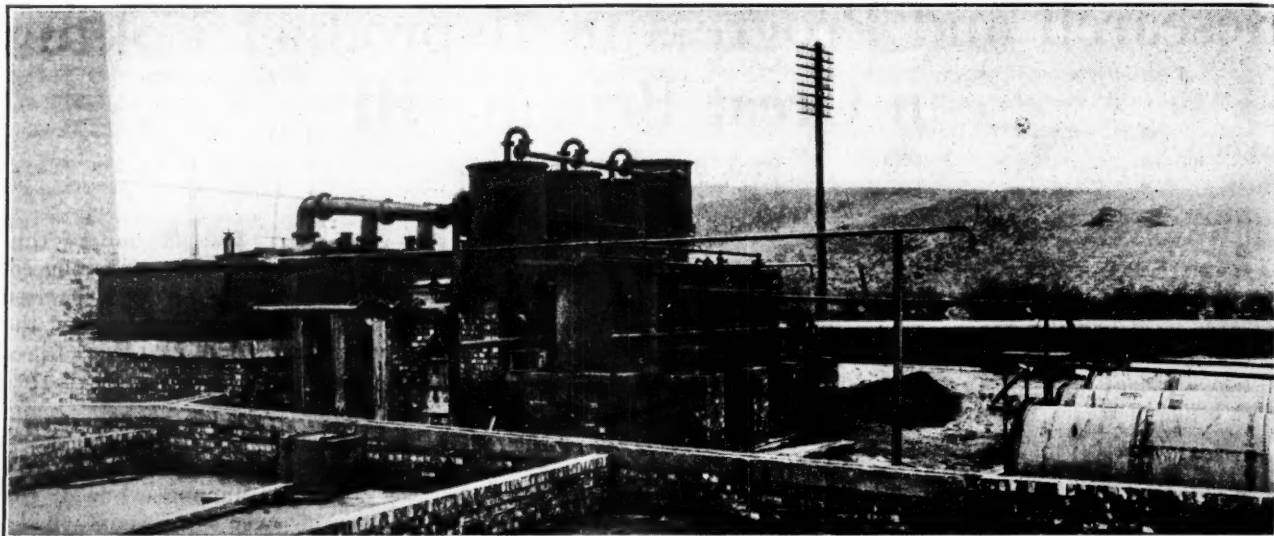
The corresponding figures for the United Kingdom are not available for publication; but according to Walmsley, at the beginning of the war practically the whole of the benzol produced in this country was obtained from byproduct coke ovens. The supply from this source amounted to 32,000,000 gal. per annum. The coal carbonized in English gas works would, however, yield another 60,000,000 gal. of benzol, and since all the leading gas works in the United Kingdom are now washing their gas with creosote oils and extracting the benzol, it follows that the English production of this carbon compound is now largely in excess of the 38,000,000 gal. estimated as the output in 1914.

In the following pages a résumé will be given of recent papers and articles which have appeared in English technical publications on benzol recovery and rectification.

The extraction of benzol from the waste gases of coke ovens is carried out in all plants on the same prin-



GENERAL VIEW OF HIRD CONTINUOUS TAR DISTILLATION PLANT



ANOTHER VIEW OF A HIRD CONTINUOUS DISTILLATION PLANT

ciple and by similar means. The tar and ammonia are first removed from the hot gases by cooling, spraying and treatment with sulphuric acid. Then, after further cooling, preferably down to atmospheric temperature, the gases are washed with creosote oil, in order to absorb the benzene, toluene and xylene which have escaped absorption by the tar. If the cooling of the gases be carried too far before the tar is separated, or if the gases are left too long in contact with the tar, the latter will contain a larger proportion of benzols and of the light oils when distilled; but in no case can complete separation be effected in this way, and therefore the use of creosote oil for washing the gases is always required. The oil, after the absorption of the benzol from the gases, is subjected to distillation by means of direct heat, or by steam, and the product obtained by condensing the distillate is the crude 65 per cent. benzol of commerce.

Recent progress and research in the United Kingdom have been devoted toward improvements in carrying out the foregoing process, and no very fundamental changes in principle or method have been made, or are to be expected. The best results no doubt can be obtained when the wash oil is atomized or sprayed into the gases, since this method produces a more intimate contact of the absorbing medium with the products to be recovered. The cooling of the wash oil is easily carried out in this case, by placing the suction and pressure pipes connected to the circulating pump in a cold water or brine solution.

As regards the chemical and physical characteristics of the creosote oil used for absorption, it is important that this should be as free as possible from naphthalene, and quite free from water. Walmsley and Morley in a paper read before the Manchester District Institute of Gas Engineers in November, 1916, give the following specification for a suitable oil:

RETORT TEST WITH BULB OF THERMOMETER, IMMERSSED IN LIQUID

Specific gravity.....	1.035
Dropping point.....	210 to 220 deg. C.
50 per cent. distils over at.....	250 deg. C.
80 per cent. distils over at.....	300 deg. C.
Water content.....	Traces

On cooling the distillate (obtained up to 300 deg. C.) to 7.2 deg. C., and maintaining this temperature for 30 minutes, the solid naphthalene settling out, on being filtered and pressed, should not amount to more than 7 per cent.

With regard to the presence of water, the authors of this paper point out that care is required at four points if the washing oil is to be kept free from this objectionable constituent.

The presence of water in the oil may be due to: (1) Water carried over in mechanical suspension in the gas from the scrubbing apparatus immediately preceding the oil-washing apparatus. (2) Water deposited in the oil, due to the temperature of the gas being reduced in the oil scrubber. From this it follows that the incoming oil should be at a slightly higher temperature than the gas. (3) In steam-heated stills water may be condensed in the oil by defective working of the still due to (a) the supply of steam being in an insufficiently dry state, (b) condensation of steam in the still due to low temperature of entering oil. (4) Lastly, there is the water which may be present in the oil when purchased.

The efficiency of a benzol washing or "scrubbing" plant, however, depends upon many other factors besides the quality and amount of the wash oil, and J. A. Wilson, in a paper read before the Coke-Oven Managers' Association at Sheffield, in November, 1916, stated that one of the chief of these was that of laboratory control, which should include daily tests of the gas, before and after it had passed the scrubbers, and regular sampling and testing of the oil at various points in the circulating system. The temperature of the gas and the area of the scrubbers or absorbing chambers, in relation to the volume of gas to be dealt with, are also factors of importance, and Mr. Wilson in his paper stated that at the Devonshire coke works at Staveley they used "the ordinary scrubbers filled with boards, the final scrubbing, however, taking place in rotary scrubbers. The distribution of the oil in the tower scrubbers is effected by means of 3-in. pipes, radiating from a 3-in. circular cast-iron main. . . . The area of the scrubbers should be such that ample time contact is allowed between the gas and oil, more particularly as the process of benzol absorption by creosote oil is a purely mechanical one. A good allowance for the space to be occupied by the scrubbing boards is 16 cu.ft. per ton of coal carbonized per day. The amount of oil circulated should be such that a saturation of not more than 3 to 4.5 per cent. is shown, the water content of the oil being approximately 1 per cent."

With reference to the effects of the temperature of the gases and of the presence of water upon the absorptive power of creosote oil, W. Diamond, manager of the Marley Hill Coke Works, County Durham, has contributed some figures bearing on the subject to the *Gas World* of Mar. 2, 1918. These are reproduced, together with his remarks, below:

To recover the maximum quantity of benzol from coal gas the washing oil should have a specific gravity between 1.04 and 1.06. Coal-tar creosote absorbs five times as much benzol as filtered anthracene oil. The amount of water in the washing oil should not exceed 1 per cent.; the presence of 2.5 per cent. in creosote oil reduces its efficiency by over 35 per cent.; 7.5 per cent. by 45 per cent. and 10 per cent. by 73 per cent. By reducing the temperature of the gas below 15 deg. C. and that of the washing to 0 deg. C., absorption is increased by 20 per cent., but the cost is prohibitive. The extraction of 2.1 gal. of benzol from gas per ton of coal results in a decrease of 4.5 per cent. in the calorific value of the gas, removal of 2.5 gal. produces a decrease of 7 per cent., and of 3 gal. a decrease of 8 per cent.

ABSORPTION OF BENZOL

	Gal.
Coal-tar creosote free from water.....	0.22
Coal-tar creosote 2.5 per cent. water.....	0.14
Coal-tar creosote 5.0 per cent. water.....	0.14
Coal-tar creosote 7.5 per cent. water.....	0.12
Coal-tar creosote 10 per cent. water.....	0.06

When the quantity of water becomes 10 per cent. and over, the results are irregular; but below this the results seem regular. It is of course necessary that the lowest possible temperature to which one is able to reduce the gas should be used, as the lower the temperature of the wash oil and gas the greater the affinity.

There are two methods of recovering the benzol from the creosote oil used for absorbing purposes—by heating in direct-fired stills, using either solid or liquid fuel, and by heating in steam-heated stills or columns. For small plants the former method is the simpler and the apparatus therefore is the less costly to erect. But when the works is dealing with the gas produced by coking 50 tons of coal per day or over, the steam-heated still is usually employed, since it is much the more easily controlled and in fact is almost automatic in its action. In a recent paper on this subject, read at Sheffield before the Midland Section of the Coke-Oven Managers' Association by J. B. Hamer, manager of the coking plant of the Middleton Estate and Colliery Co., of Leeds, the author stated as follows:

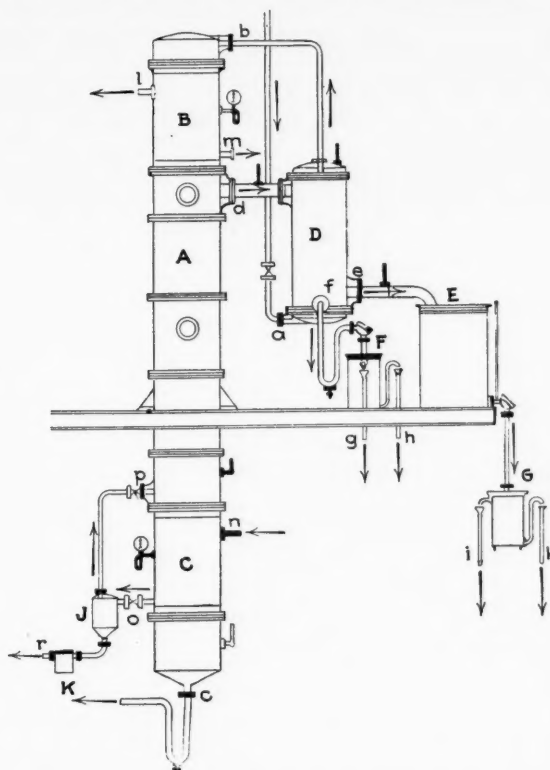
The modern type of plant for treating saturated oils after they have absorbed the benzol products from coal gas is the continuous steam-heated still. This plant has gradually reached a high standard of perfection by the addition of improvements which have aimed at economy in the fuel consumption, high stripping efficiency and good quality of the crude benzol. The arrangements consist of stills, preheaters, heat exchangers, superheaters, dephlegmating devices, condensers and oil coolers. The aims of the designers of the various plants have been to heat the wash oil to as high a temperature as the available steam heat will permit, and to do so as economically as possible. Thus there are the superheaters giving the final temperature to the oil entering the still, and preheaters and heat exchangers as aids to economy. The consumption of steam in the recovery of one ton of 65 per cent. benzol amounts to from 3 to 4½ tons, the production thus costing from \$1.25 to \$1.87 per ton in fuel alone.

The main advantages of the continuous steam stills as against the direct-fired pot stills of earlier days are less danger from fire, smaller plant (hence smaller capital charges) and the smaller oil storage necessary. The disadvantages are that efficiency is dependent on an absolutely uniform steam temperature, and that there are more complications—more moving parts—and higher fuel consumption.

No doubt in many of the continuous steam plants much waste of steam ensues owing to faulty design of the still

proper. Simon-Carves & Brown have lately introduced an improvement in this direction. This consists of an internally arranged preheater in the still, so that the wash oil as it gravitates through the apparatus gains heat during debenzolization, thus doing away with the anomaly of the older type of plant, where the wash oil loses heat in the still. With regard to stills in which the wash oil loses heat in its passage, this type is not only wasteful and irrational but some of us are aware from costly experience of the difficulties which occur when part of the elaborate preheating or heat-exchanging plant fails. The anomaly referred to then becomes an accessory to conditions which lead to chronic emulsification of condensed water and oil.

Discussing the practical details of the working of a crude benzol plant, the author makes some sensible



KUBIENSCHKY SYSTEM OF TAR DISTILLATION

remarks upon the differences of opinion which exist among managers upon such questions as: (a) The best temperature for the wash oil to enter the still. (b) The temperature of the stripped oil leaving the still. (c) What should the "light-oil" content of the debenzolized absorbent be? (d) How does the percentage of water remaining in the oil affect its absorbent efficiency in the gas washers? (e) What is the best strength to make crude benzol? The author explains that the variety of opinions expressed in respect to these questions is due to the fact that there are no two plants exactly similar in every detail, and that each manager naturally is in favor of the conditions which have been found to give the best results in his own plant.

Concerning the important questions of still design and steam consumption, Mr. Hamer gave the following useful notes and hints:

With the still which makes no provision for the addition of heat during debenzolization the wash oil should leave the indirect steam-heating system within 10 deg. C. of the steam temperature; otherwise the preheating and superheating system is inefficient, and excessive consumption of direct steam may be expected in the still.

The outlet temperature of the oil, when it is less than the inlet temperature, is seldom very much of a guide to the working of the plant. Provided that the wash oil is sufficiently hot when it enters the still, the quality of the crude benzol is regulated by the direct steam admitted and by the dephlegmating devices. These latter should have sufficient latitude to be independent of the heat-exchanging system, and ample provision should be made for preventing the dephlegmating light oil, naphthalene and water of condensation passing back again through the still. The higher the temperature of the oil leaving the still the less chance is there of water passing away with the oil, and thus of a reduction in the efficiency of the oil-cooling plant. Owing to the use of about one ton of direct steam on the production of one ton of crude benzol, the outlet temperature of the oil will generally be found between the limits of 102 and 108 deg. C. The factors affecting this particular temperature are the saturation of the wash oil, the height of the still, the speed of the oil passing through the system and the temperature and quantity of the direct steam necessary for the quality of crude benzol produced, so that in reality there can be little control of this temperature.

The quantity of direct steam admitted to the still should, in conjunction with efficient preheating, be sufficient to insure the removal of all the products absorbed by the oil at the scrubbers, so that the efficiency to be aimed at is to have the debenzolized oil of the same quality as the fresh unused absorbing oil—that is, giving not more than

increases as the oil loses its benzol contents. The principle of countercurrent heating is adopted to obtain this result, the oil entering the still with a temperature of 110 to 115 deg. C. and leaving it with a temperature of 130 to 145 deg. C. The total steam consumption in the Gasser still is stated by Hamer to be about 2½ tons per ton of 65 per cent. benzol produced.

As this type of still may be new to some of the readers of *Coal Age*, the following description of it, abstracted from an article in the *Révue Générale Chimie* by L. Fabre (through the *Chemical Trade Journal*, of Nov. 3, 1917) is here given.

The saturated oil enters first into a tubular heat exchanger and is heated by the benzol vapors and steam coming from the stills. The oil then passes into a second heater, which acts at the same time as a hydraulic seal or closure for the still, and in which the heat exchange is effected by the hot benzol-free oil coming from the stills. The oil then passes into a third reheater, consisting of cylindrical elements provided with superheated steam coils, and passes thence into the distilling apparatus. This consists of a number of cylindrical elements furnished with steam coils and jets. The coils maintain the necessary temperature and the jets remove the benzol. After leaving the stills, the oil passes through the reheater above described, and after cooling it is conveyed to the column. On the other hand, the mixture of steam and about 50 per cent. benzol are conveyed from the still into a dephlegmator, the surface of which consists of cylindrical cells, thence into a second dephlegmator consisting of three tubes filled with coke, to absorb the last traces of oil. The mixture goes thence into the oil reheater and finally into a cooler, where it is cooled down to 20 deg. to 25 deg. C. The water and benzol are then separated in the usual way.

An improved debenzolizing process and apparatus which requires no steam at all is, however, the latest advance in benzol recovery. Such a process was described in a paper read by W. Greaves before the Midland Section of the Coke Oven Managers' Association, at Leeds, in February, 1918.

An apparatus based on the same principle was tried 15 years ago for separating the first fractions of the distillate in tar distillation. It has been applied lately with success to the recovery of benzol from the wash oil.

The benzol is extracted from the gas by the usual method of scrubbing, but instead of the benzolized oil being then brought into contact with live high-pressure steam in the ordinary form of benzol still, it is pumped under pressure through a cast-iron coil heated to a temperature of 145 deg. C. by hot furnace gases. The hot benzolized oil is sprayed into a small still, or dephlegmator, the inside of which is at atmospheric pressure. The benzols and water vapor pass away to a condenser and separator to divide the condensed water from the benzol, while the dehydrated and debenzolized oil flows to the oil coolers, to be again used for absorbing the benzol from the gas. In this simple manner it is easy to produce the ordinary 65 per cent. crude benzol. The advantages of the method are as follows:

1. Small capital cost. The plant requires no house; ground space covered is small; the parts of the apparatus are less expensive than that required for the ordinary method of producing crude benzol.
2. Any inferior fuel can be used for heating the coil. It enables the heat in the fuel to be employed direct.
3. Simplicity of working. All that the attendant has to pay attention to are the fire, pump and thermometer.
4. Durability. The installation to which reference is made was started some 20 months ago and was stopped only a few days ago, as it was thought desirable to test the duplicate set of coils. The latter are working with equally satisfactory results.

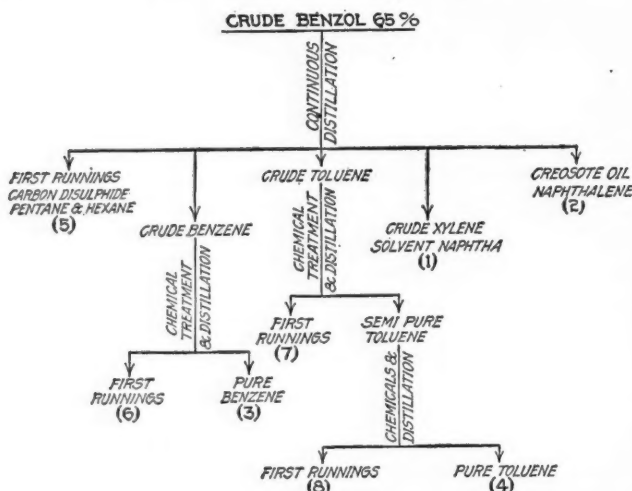


DIAGRAM ILLUSTRATING PURIFICATION OF BENZOL BY CHEMICAL TREATMENT AND DISTILLATION

The distillates numbered 1, 2, 3 and 4 are final products; 5, 6, 7 and 8 are distillates returned to the process for further treatment. Product 4 (pure toluene) is the most difficult to prepare, and sometimes four distillations are required, with chemical treatment between each, to obtain it in the pure state.

5 per cent. distillate at 200 deg. C. It then requires very efficient fractionation of the distillate leaving the still to insure that the crude benzol does not leave more than 10 per cent. of residue when distilled in a retort to 190 deg. C. The dephlegmates from the vapors distilling require careful separation of the condensed water, and cooling, in order to remove as much naphthalene as possible. The clear oil is then usually returned to the absorbing oil, but where a tar-distillation plant is available more profitable uses may be found for it.

Other problems of benzol rectification discussed in this paper were the effects of water on the absorbing oil, the importance of systematic tests, washing the "once-run" products and the final rectification.

The most efficient of the modern types of continuous steam-heated debenzolizing stills is probably that of Gasser, the design of which recognizes the fact that a washing oil saturated with benzol requires less heat to liberate the benzol than one which is not so highly charged. The temperature in the Gasser still, therefore,

5. Quickness of erection. The plant was set to work within four months.

This system of treating the oil and separating the benzol is of course much cheaper and simpler to operate than any of the steam-heated continuous stills, and Greaves estimates the fuel cost per ton of recovered benzol to be under 50c. per ton.

CRUDE BENZOL AND ITS RECTIFICATION

The crude benzol obtained by debenzolizing the wash oil is a mixture of benzene (C_6H_6), toluene ($C_6H_5-CH_3$) and xylene ($C_6H_4-2CH_3$), with certain impurities. It is classed and known as 30, 50 or 90 per cent. benzol, according to the amount which distils over before the thermometer in the distillation test flask touches 100 deg. C. The boiling point of pure benzene is 30.5 deg. C., of pure toluene 111 deg. C., and of pure xylene 139 deg. C., so that the separation by repeated fractional distillation of these three constituents of commercial benzol from the impurities and from each other is quite possible. The hydrocarbons which distil after the xylene are known as solvent naphtha. This contains "cumene" in addition to other more complex compounds.

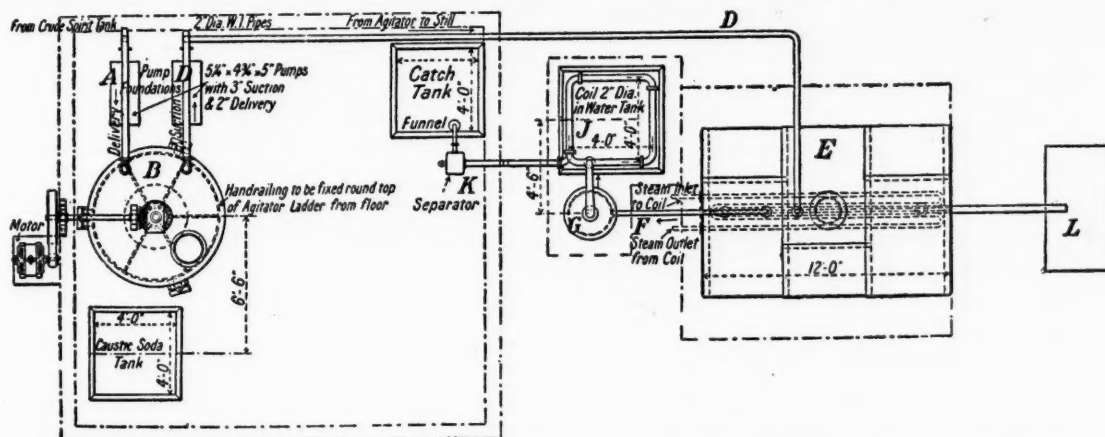
The relative proportion of the various constituents contained in crude benzol of course varies with its

In those works, however, where the production of pure benzene, toluene and xylene is aimed at, the crude benzol is separated into three fractions, each of which is submitted to the washing treatment separately in order to economize in the use of acid. As regards the type of still and condenser employed for this "fractionating" of the crude benzol, a column provided with "bell-lutes" is preferable to the perforated-plate type, since the holes in the plates are liable to get stopped up with rust or other matter. Hamer, in the paper already quoted, however, recommends for this stage of the rectification process the Gasser type of still, and states:

The working of the primary still should be as slow as possible for the first or forerunning fraction. The water overflow of the analyzer should show a temperature of at least 10 deg. C. lower than the normal reading for the benzol fraction. (This temperature varies for the different types of apparatus.) The rate of flow of the condensed products should be fixed about half the normal rate. By these means a large proportion of the unsaturated hydrocarbons and carbon bisulphide are removed as the forerunning fraction.

On the subject of washing the "once-run" products, Hamer's paper is also worth quoting:

The first washing is usually a preliminary wash of from 5 to 10 gal. of D.O.V., according to whether the size of



PLAN OF BENZOL RECTIFICATION PLANT AT MITCHELL MAIN COLLIERY CO. COKE OVENS

source and the conditions of its recovery, but the following may be taken as an average yield for English practice:

	Per Cent.
Benzene (90 per cent.)	60 to 65
Toluene (90 per cent.)	5 to 8
Solvent naphtha	6 to 8
Heavy naphtha	4 to 6
Total	75 to 87
Losses in washing and in absorbing oil	10 to 20

Modern rectification practice in the byproduct coke works in England is based on redistillation, chemical treatment and fractionation. The redistillation has for its purpose the separation of the naphthalene and those fractions of the absorbing oil which have been carried over with the steam in the debenzolizing process. It is carried out in large stills and is called "blowing-over." Either two or three fractions are collected, according to the scheme of after treatment in view.

In works where it is not intended to carry the refining process further, the usual plan is to obtain two fractions—the light oils which come over up to the appearance of steam and the heavy oils, which follow until naphthalene makes its appearance at the condenser exit.

The charge is 1000 or 2000 gal. The object of this preliminary wash is to dry the benzol thoroughly; it also serves to remove pyridine bases, and to some extent attacks the more easily decomposed unsaturated hydrocarbons. Half-an-hour's brisk agitation of this first wash of sulphuric acid is ample, after which a period of one hour is allowed for settling, and the acid is then run off as completely as possible. A further quantity of acid is then run into the washer, equivalent to 2½ to 3 per cent. by weight of the charge; agitation is maintained for at least an hour, and during the period allowed for settling a sample is taken and tested.

The quantity of acid required for the first or main acid wash largely depends on the care taken in, and the efficiency of, the once-distilling operation. Where washing in bulk of the once-run benzol is the practice, it will generally be found that a further additional wash of about 2 per cent. of acid is required to produce a clean rectified benzol.

After the treatment with and removal of the acid, the charge is washed four or five times with water by spraying onto the benzol and allowing it to fall in the form of a fine rain. Finally, treatment with a 10 per cent. caustic soda solution is given, followed by two further washes with water.

Chamber of Commerce to Consider Reconstruction Problems

MANY phases of reconstruction will be taken up at the Reconstruction Conference of Industrial War Service Committees called by the Chamber of Commerce of the United States for Dec. 3, 4, 5 and 6 at Atlantic City, N. J. The sudden termination of the war has brought reconstruction to the front as the one important problem today facing business men. In the congress of business interests at Atlantic City an opportunity is offered for industry to advise the public as to those questions which primarily affect business.

The program for the conference has not been completed, but enough of the details have been worked out to indicate the comprehensive way in which this conference will approach the problem of reconstruction. On Dec. 3, the first day of the conference, the 350 war service committees meeting separately will take up questions of special interest to their own industries. At these meetings there will be formulated the policies of the industries represented by the committees and resolutions which individual crafts desire to present during the conference.

For the purpose of facilitating discussion and coördinating the ideas of the various industries represented, the war service committees after meeting separately will gather together in 35 related groups. Afterward these related groups will assemble as ten major groups representing the ten primary industries within the United States.

The ten groups as defined for the purpose of the conference are as follows: Food products, textiles, heat, light and power, metals and minerals other than iron and steel, iron and steel, wood and wood products, chemicals, leather, earthen products and industrial professions. One of the 35 related groups is "coal and coke." A list of 25 questions has been sent out by the War Service Executive Committee to the members of all war service committees for use as a basis for the deliberations of the individual war service committees at their first meeting. These suggestions are not considered exhaustive, and members of the committees have been requested to present other subjects which they think should be discussed. The subjects are set forth in the following communication to the committees:

1. What legal methods or means, affecting the appended items, could be introduced in the craft to better stabilize prices, during the reconstruction period.

- a. Inventories on hand.
- b. Orders placed at war prices but not delivered.
- c. Labor costs and conditions.
- d. Increased taxes.
- e. Increased rates of interest.
- f. An estimated increased demand for non-war materials restricted during the war period.
- g. Will an increased production of your commodity increase the price of material or labor, or will a controlled redistribution of material and labor from war industries prevent such an increase?

h. Discuss the practice of the sale of commodities at a price less than the cost of production; its injury and disturbance on the industries and the ultimate consumer. What methods would you suggest to remedy this evil?

i. If the Government sees fit to dispose of used materials and products in the open market, what effect will it have on your production and the sale of new goods? At home? Abroad?

j. If it is not advisable for the Government to sell these goods on hand, either home or abroad, what shall it do with them?

k. In this connection, what point of contact should business interests have with the Governmental departments in the sale or disposition of these various commodities?

2. What is the estimated amount of labor, skilled and unskilled, male and female, required for the estimated 1919 production? What is to be the source of labor? How much must be moved? How much have you lost to war industries?

3. What is your financing problem during the reconstruction period? Do you recommend Governmental aid? Is financial legislation needed? Should the Capital Issues Committee be continued during this period?

In this connection discuss and recommend what financial obligations, if any, the industries in your craft are under to the Government for moneys advanced for buildings, machinery or as loans or security for Government contracts. How are these to be liquidated or adjusted?

4. What method would you suggest for the cancellation of Government war orders with your craft, that would create the least amount of hardship on the industries and permit a readjustment to normal commercial conditions?

5. On undelivered Government orders, what percentage of materials on hand, supplied either by the Government or purchased by you for these Government orders, can be utilized by your craft for commercial purposes during 1919? What disposition shall be made of those not usable?

6. Have you any suggestions to make as to the continuation of the War Industries Board or any of its divisions, or any other Governmental departments during the period of reconstruction, such board or departments to have the authority to control materials and regulate prices? If so, for what period?

7. What intelligent control of materials during the reconstruction period could the War Service Committee suggest which would prevent an over or under supply and avoid a demoralization of the market? Should this be controlled by the crafts or by a Governmental agency?

8. What effect had the war program on your output? Was it increased or decreased? Will there be an increased demand during the reconstruction period? If materials are uncontrolled will prices go up or down?

9. What is the estimated tonnage or unit of production of your raw materials for 1918? For 1919? Estimated demand for foreign commerce for 1919?

10. What is the estimated demand for your finished product for 1919? How does this compare with the average demand per annum in weight or unit of production for a five-year period immediately prior to 1914?

11. Sources of your raw materials? Domestic or imported? If domestic, can railroad cross-hauling be eliminated by purchasing nearer your plants? Causes of cross-hauling? If imported, at what ports? Would other ports of entry be more advantageous? What ports and why?

12. The value of a uniform method of cost accounting for the individual manufacturer and the craft as a whole.

13. What suggestions of the Conservation Division made to your craft might, with financial profit to your craft, be continued during the readjustment period? Is it possible to maintain a conservation schedule after the war, without legislative authority?

14. What methods and practices, other than those your craft has already introduced, would simplify production, save materials, eliminate wasteful practices, reduce the number of styles, without destroying individual creativeness?

15. What propaganda are necessary to educate the retailer and consumer to accept these eliminations and simplifications, and what plans might be arranged for better functioning with committees of jobbers and retailers handling your commodities?

16. What percentage of the commodities represented by your war service committee was produced in the United States before the war and what percentage imported? What suggestion have you to make for increased production for domestic and foreign commerce?

17. What effect will foreign competition have on your business? Will it increase or decrease your production?

18. What is the underlying reason for the importation of foreign-made goods—Prices? Styles? Label? Design? Or excess demand over domestic supply?

19. What disposition should be made by the Government of her merchant marine?

20. What steps have you taken, or do you propose to take, for the entire craft to take advantage of the Webb-Pomerene Bill, which allows combination for foreign trade, or have you other plans? What do you suggest as the best means of financing foreign credits? What percentage of the foreign commerce heretofore controlled by Germany can your craft obtain and supply?

21. What study is necessary, and what suggestions have you to make, in order to determine what are the needs of our allied countries for rehabilitation, and how far can you supply both raw and finished materials until they have been rehabilitated?

22. Has your craft been solicited by, or are you soliciting, foreign countries to supply these materials for rehabilitation purposes? If solicited, does this come from the Allies, or from neutral or enemy countries?

23. Would you recommend the appointment of a committee of United States manufacturers to confer with similar committees from our Allies, to learn of their plans for protecting industry during the reconstruction period? Also to obtain information regarding commodities and supplies needed by them and ourselves during this period.

24. When the demobilization of military forces takes place, how can these men best be returned to their former industrial pursuits, and how will it affect your labor situation?

In this connection, how closely should the conference work with the Governmental bodies in the study of demobilization plans?

25. What suggestions have you to make to encourage and stimulate public work, such as the building of roads, pavements, water and sewer extension, the construction of public buildings, schoolhouses, etc.? What effect will it have on the labor market?

In this connection consider the building program in the United States and especially the utilization or destruction of new plants built for war purposes. Location of convalescent and reconstruction hospitals near industrial centers, so that these men can be trained in the factories nearest to the hospitals without creating new vocational schools.

The committees are anxious to receive from industry such information and advice as will enable them to properly mirror the attitude of the industrial world to business problems. Such communications from the coal and coke industry may be sent direct to the Coal and Coke Committee of the Reconstruction Conference, Atlantic City, N. J., or can be sent to *Coal Age* for submission to the proper committee on Dec. 3.

Experience has shown that in the United States the normal balance in transportation which brings about a maximum of production with maximum economy occurs when out of every 100 tons of originating freight approximately 56 tons are unmanufactured mineral products and 44 are manufactured products, foodstuffs and other commodities, and when of the 56 tons of mineral products 35 tons are coal. Of these 35 tons of coal the railroads themselves consume about 12 tons.

Coal Mining Institute of America

The Coal Mining Institute of America will meet Dec. 4 and 5 at the Fort Pitt Hotel, Pittsburgh, Penn., opening with a question box presided over by Vice President Fohl. The questions are as follows:

1. Are roller bearings too delicate for coal-mine cars?
2. What are you doing to increase the efficiency and steady working of your employees? With what success are you meeting?
3. In what ways can the conservation of materials and supplies be best effected both inside and outside the mines?
4. Is the underground use of alternating current more hazardous than the use of direct current?
5. Has the law permitting the employment of non-certified officials in coal mines been detrimental to their efficient and safe operation?
6. Is there any practical way of dealing with a drunken miner who is above the draft age or one who has been given deferred classification through some other cause than an industrial claim?
7. To what extent can the water-gage chart be used as an index of the volume of air passing through a mine?
8. Should the drawing of mine timbers be penalized under the safety standards in computing compensation insurance rates? If so, under what conditions?

At the dinner, which will take place on Wednesday evening, Dec. 4, S. E. Button, chief of the Pennsylvania Department of Mines; J. B. Neale, Federal Production Manager, and W. R. Rasmussen, of the National Safety Council, and several representatives of the Government will be present, including, if it can possibly be arranged, Franklin K. Lane, Secretary of the Department of the Interior.

On Thursday E. N. Zern will give an address on "Loading Machinery in Coal Mines"; K. W. Mackall, on "Use and Abuse of Headlights on Mine Locomotives"; K. C. Barth, on "Preservative Treatment of Mine Timbers as a Conservation Measure"; J. C. Davies, on "Re-opening a Mine Following a Mine Fire," and John Andrews, Jr., on "Power Losses Inside the Mine and How to Correct Them."

Legal Department

MINER'S WORKING PLACE—A track in a mine used for removing coal in the pulling of pillars, but not as a usual means of going to and from work, was a part of the working place of a miner engaged at work there and not such "traveling way" as obligated the operator to keep the place safe from falling rock. (Colorado Supreme Court, *Roqui vs. Calumet Fuel Co.*, 173 Pacific Reporter, 943.)

USE OF DANGEROUS TOOLS IN TAMPING CHARGES—A coal operator is not liable for injury to a miner, caused by premature explosion of a charge of powder which the latter and his helper were shoving into a drilled hole by means of a steel tamping bar, where the injured man was a certified miner, had had several years' experience in mining, furnished his own tools, and had just as good means of appreciating the danger to which he was exposed as did his employer. Under such circumstances, the employer cannot be regarded as having been negligent in permitting plaintiff to use the particular bar. There is a general rule of law to the effect that where one obtains employment by holding himself out as being skilled in his trade, he cannot afterwards assert negligence on the part of the employer because of failure to instruct him in matters which men so skilled are presumed to know. (United States Circuit Court of Appeals, Second Circuit; *Sawickas vs. Lehigh and Wilkes-Barre Coal Co.*; 247 Federal Reporter, 432.)

News From the Capitol

By Paul Wooton



Work Started by Fuel Administration May Be Kept Alive After Peace Is Declared

Definite recommendations have gone to the President from the four great war agencies—the Fuel Administration, the War Trade Board, the War Industries Board and the Food Administration—as to those of their functions which should be continued. These recommendations have not been made public. So far as the Fuel Administration is concerned, however, it is fairly well understood that the continuation of the zone system, of the conservation work and of the statistical compilations has been recommended.

So far as can be learned there is no intention of trying to keep the Fuel Administration alive after the expiration of its legal existence. The continuation of the zone system probably will be in the hands of the Railroad Administration. Conservation and statistics also can be handled by existing governmental agencies. In both these divisions the Fuel Administration has made a remarkable showing. No less than 11,000,000 tons of coal are being saved annually, it is stated, as a result of the conservation efforts of the Fuel Administration.

Coal statistics, prior to the war, were handled largely by the Geological Survey. Some work along that line was done by the Bureau of Mines. In neither case, however, were the appropriations for the work at all adequate for comprehensive compilations. By close cooperation with the statistical bureaus of private enterprises, especially the railroads, a considerable number of very valuable statistics was made available. Since the war, however, the railroad statistical bureaus have been discontinued. Some of the bureaus maintained by coal operators have been discontinued. As a result, the Government could not do justice to the industry in allowing no larger expenditure for statistical work than was the case before the war.

Zoning System Saving Millions

Estimates made earlier in the fuel year, that approximately 160,000,000 car-miles would be saved in the coal year through the operation of the zone system for the distribution of bituminous coal, are being fully realized, it was announced on Nov. 16 by the United States Fuel Administration.

This system, made possible through the close coöperation of the United States Railroad Administration with the Fuel Administration, has had a large share in bringing the nation's supply of bituminous coal to its

present proportions, which, with patriotic economy, will be sufficient for the winter's requirements.

This method of distribution was established so that the coal supply of all sections of the country should normally be derived from mines relatively near, thus preventing abnormal and wasteful transportation movements, and insuring more equal distribution of cars to the mines and the more steady employment of mine labor.

Early estimates were that the movement of bituminous coal affected by the zone system would involve about 300,000,000 tons, or 60 per cent. of the total production. The latest figures show that 368,858,000 net tons of this kind of coal have been produced and delivered since Apr. 1, 60 per cent. of which is affected by the zone system.

These later figures show that even more than the originally estimated 160,000,000 car-miles will be saved in round trips to and from the mines and that considerably more than the 300,000 additional trips, which the saving in car-miles would effect, will be made. Exact figures have not been compiled, but the early estimate allowed for the 300,000 additional trips being the equivalent of 5 per cent. increase in the production.

Fuel Administration Issues Warning

A tendency in some quarters to take it for granted that the war is over, and that therefore all bars are down, has made it necessary for the Fuel Administrator to issue the following warning:

"In order that there may be no confusion or misunderstanding, the United States Fuel Administrator wishes it understood that the signing of an armistice in no way alters the rules and regulations or the supervision now in force. By Act of Congress the Fuel Administration continues until the promulgation of the treaty of peace and its powers extend to the production, distribution and conservation of fuel, including fuel oil and natural gas. Due notice will be given of any cancellations or changes in orders and regulations by the duly authorized officials of the Fuel Administration in Washington."

Applications for mine sidetracks are to be made "as in pre-war days," the Fuel Administration announces. This is believed to be the forerunner of the relinquishment of certain other powers which have been exercised by the Fuel Administration. More than 800 applications for sidings and auxiliary tracks have been handled by the Fuel Administration. Most have not been granted.

Transportation Conditions Generally Satisfactory

Reporting to the Railroad Administration on transportation matters the Fuel Administration has made the following observations:

Eastern, Allegheny and Pocahontas Regions—Transportation ample and surplus car supply, except on Baltimore & Ohio R.R. Some little difficulty on the Chesapeake & Ohio R.R. and Monongahela R.R.

Tidewater—Vessel and car supply ample.

Lake—Bituminous program completed and shipments discontinued Nov. 16.

Southern and Western Regions—Transportation and car supply ample. Movement slower account influenza.

Coke—Beehive production stationary. Byproduct production somewhat reduced.

General—Coal production further reduced account illness and elections; but bituminous supply ample throughout the country.

The Railroad Administration also has made public that "Utah coal mines are running on short time on account of the lack of orders," and that "shortage of labor has delayed the loading of cars at mines in the Pocahontas region and has delayed dumpage at tidewater."

Formal Order Closing Lake Trade

The text of the order with regard to the closing of navigation on the Great Lakes is as follows:

"Except in individual cases where shippers have unfilled obligations for coal needed for special uses, and such shippers can assemble cargoes rapidly enough to avoid delay to railroad equipment and vessels assigned for this particular coal, all loading of bituminous coals for Lake Erie ports will be suspended with the close of business, Saturday, Nov. 16, 1918.

"Except for the individual cases named above, all loading of cargoes of bituminous coal at Lake Erie ports will cease at midnight, Saturday, Nov. 23, 1918.

"Definite arrangements must be made in advance with H. M. Griggs, Manager Ore and Coal Exchange, Cleveland, Ohio, by shippers desiring to forward cargoes after that date for use of car dumping machines at Lake Erie ports, as the existing pooling and loading arrangements of the exchange will be discontinued at midnight Nov. 23.

"Shipments of anthracite coal to the Upper Lakes will be permitted to the extent of the regular allotment as previously determined by the United States Fuel Administration under individual arrangements between shippers and carriers for the floating of this coal up to the date of the closing of the lake navigation."

Await Return of Fuel Commission

Return of the Fuel Administration's Commission, which now is in Europe, is being awaited with much interest. As yet, the Commission has cabled none of its observations and it is regarded as probable that no report will be made until its return, which is expected about Dec. 20.

Prior to the return of the Commission, it is not probable that the matter of extending aid in the rehabilitation of the French coal mines at Lens will be gone into deeply. It is understood that the French Government

already has in storage here a considerable quantity of coal-mining machinery. This machinery was purchased two years ago, when it was thought the Lens regions would be liberated. Further purchases of machinery for this purpose are being negotiated, it is said.

The introduction of American mining machinery into French and English mines is expected to open new markets to American machinery manufacturers. Conditions which have interfered in the past in the use of machines in English coal mines are changing, it is believed. No objection on the part of French labor to the use of machines is anticipated.

Fuel Restriction Modified in Cement and Clay Products Industries

Percentages of curtailment of fuel to be used in the manufacture of clay products and cement have been cut in two. This action has been taken by the Fuel Administrator in view of the increased supply of bituminous coal now available. Under present conditions, fuel curtailment in the industries mentioned must be the following per cent. less than normal requirements: Cement, 12½ per cent.; face brick, common brick, paving brick, terra cotta, roofing tile, floor and wall tile and sanitary ware, 25 per cent.; hollow tile, drain tile and sewer pipe, 12½ per cent.; stoneware, 7½ per cent.

Price Fixed on Steam Sizes of Anthracite

Prices of steam sizes of anthracite coal are to be held below the pea size price. The order to this end reads as follows:

"On and after the effective date of this order (Nov. 17) the maximum prices for the different sizes of anthracite coal below and smaller than the size commonly known as 'pea' size, f.o.b. mines, shall not be in excess of the maximum prices established and in force, on the effective date of this order, by Executive Orders of the President and orders of the United States Fuel Administrator for that size of anthracite coal commonly known as 'pea' size, less 50c. per gross ton of 2240 pounds."

Coal Loaded During Week Ended Nov. 2

Loading of coal during the week ended Nov. 2, with the figures for the corresponding week of 1917, is shown by the following:

	1918	1917
Total cars bituminous.....	187,638	187,184
Total cars anthracite.....	29,223	31,115
Total cars lignite.....	3,530	4,134
Grand total cars, all coal.....	220,391	222,433

The decrease in coal loading has been due to influenza among the miners and railroad workers. Total increase of 1918 up to and including week ending Nov. 2, over the same period in 1917, is 723,047 cars.

A reduction of its allotment of bituminous coal has been asked for New England by the Fuel Administrators of that section. The original budget assigned 30,000,000 tons of bituminous coal to New England. It is now asked that shipments not exceed 27,300,000 Deliveries up to Nov. 1 approximated 17,000,000 tons.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

The week has been quite generally without any outstanding events, and indeed it is well that it is so. More important than any other matter is the necessity for stability at these times. We need a pivot about which to turn when retreating from war to peace. We do not want to change any of the conditions which do not need change, until we have completed all those changes which cannot be delayed.

The soldier and munition worker must go back to civil work, and business must be kept steadily going so that he can find his place still open to him in the files of industry. We must be all in line and at attention waiting for him when he comes. After he is back, and things moving steadily, then we can attack other problems. There is such a thing as trying to achieve too much. It is fortunate that there is a larger element trying to secure stability in industry than trying to upset the present regimen.

LET OUR SLOGAN BE "STAND BY THE PRESENT"

We must try just now not to rock the boat. The soldiers and munition workers crowding into the front, rear and oar seats of the industrial craft will rock it badly enough; the turning of the rudder so as to direct the boat from war to peace will also tend to upset it. If those who are waiting for the soldiers and munition workers add to the confusion by seeking new adjustments in the industrial craft, then the dangers of an upset will be multiplied. For the moment let us cry as loudly "Stand by the present" as we have cried in the past "Stand by the President."

The mine workers and operators somewhat generally are realizing their duty at this time. They are not going to engage in a conflict at a juncture so critical as the present. Some time ago the operators quite generally thought that the wages being paid were war-time wages to be adjusted later, but now they realize that war-time wages and largely also war-time prices have come to stay. The peace industries, or rather those which are principally in evidence in peace, are quite largely nonunion, and, as resumption takes place, they will have to bid for labor as war industries have, and they will have to pay the price. They will accordingly come up to a standard in accord with the cost of living.

Great Britain, France, Belgium and Germany—pardon our mentioning them together—will, we may expect, increase wages till they reach our level. In that event we shall not find their competition heavy unless we endeavor to enter places where, by reason of unfavorable transportation difficulties, we are placed at a disadvantage. When the world is levelled let us level it up rather than down.

HAYES STILL DEMANDS A NEW WAGE SCALE

Frank J. Hayes, the international president of the United Mine Workers, on Nov. 15 delivered a statement condemning lowering of wages—which was right—but urging increases—which was wrong. Those who have not had increases during the war or whose increases have been small may be justified in looking for the mine workers to pay them more money, but they strongly resent the action of those men who claimed and got big wages because their work was essential to the war and who now want still bigger wages when peace comes along. Let them go back into the corner of the field and let the others take their place at the trough. It may be added that all authorities do not agree with Mr. Hayes that there is no likelihood of prices declining for a year. They may decline enough to send profits aglimmering. They will not lower markedly.

however, for they are based on high wage scales which will not, we hope, be lowered. His statement is as follows:

"Wages have gone up during the war, but they have not advanced proportionately to the increased cost of living. All authorities agree that there is no likelihood of prices declining for at least a year. But despite this prophecy, councils of employers are now devising programs to batter wages down. It is this scheming that organized labor must combat. We cannot parley, linger, wait. Our forces must be up and doing, not only to thwart attempted reduction, but to win additional gains to meet living costs which present-day wages are so inadequate to cope with."

GOODWILL NEEDS NO CITIZENSHIP TICKET

The war being over let us not give up our Americanization plans. Nothing will make more for unity than to have us all think and speak together. For this, education is necessary. Let us avoid trying merely to make citizens. The last matters in Americanization are the possession of a court certificate and the singing of the "Star Spangled Banner." The first matter is the creation of a kindly feeling of appreciation. This appreciation can only be attained by friendliness and understanding and the understanding can only come to one who knows the tongue of this country. Given the friendly understanding, the national anthem and the certificate of citizenship will follow as a natural development. Every mining plant should have its English school, and every man who cannot speak English should be compelled to attend it. It would be well if in addition common branches of education should go with the other instruction. It would pass belief if hearing the record of the national life and achievements accompanied by the glad hand of the instructor failed to give the same intensity of passionate affection for America that is deep-seated in the heart of the native born.

In central Pennsylvania a somewhat bitter dispute has arisen as regards the Fuel Administration's request that the mine workers should work on Sunday, Oct. 27. It will not be made any less bitter by the sudden change in the coal situation from a small threatened shortage to a large surplus. The Fuel Administration did what it believed was for the best. It denies that it asked the men to violate the contract regulations in order to increase tonnage, as the contract did not make any reference to the observance of Sunday as a holiday. This is, of course, more or less of a subterfuge. The union officials declare they were not consulted and that something should have been said to them.

RIGHT TO SUNDAY REST IS NOT JEOPARDIZED

No harm has been done; rather a great good. The mine workers have been afforded a chance to show their local devotion to the national interests, and the contract stands just as rock-ribbed as ever. No one will ask for Sunday work from the miners now that an armistice is declared. Sunday work is so at variance with the movement of the national conscience that nothing but the war and the scarcity it causes will be held to justify any such activity.

Labor news is extremely scant, but as has been heretofore suggested all that comes to hand is good. From Conifer, a mine of the Allegheny River Mining Co., in Armstrong County, central Pennsylvania, we hear of a miner, Rudolph Cheney, who loaded 438 tons of coal during the month of September, or an average of 18 tons per day for every working day in the month.

West Virginia reports that the influenza epidemic is rapidly receding throughout the state except in a few spots where it made its attack somewhat late. The productive ability of the mine workers is still, however, restricted

owing to the weakness which an attack of influenza leaves as its wake. In the Fairmont region, now happily bidding farewell to the disease, the epidemic made a surprise visit to the Annabelle plant of the Four States Coal Co., and several went down before the infection.

The influenza epidemic was quite late in reaching Wheeling and the Pan Handle of West Virginia, arriving there within the last few days. A report from Moundsville, Marshall County, a few days ago stated that the epidemic was worse at that place. The epidemic invaded the settlement of the Youghiogheny & Ohio R.R. mines near Martins Ferry on Saturday, Oct. 9, in most malignant form, three deaths resulting in a few days.

The epidemic of influenza which took a heavy toll in Logan County during the last month is now believed to have been entirely checked. Dr. Hess, the Government physician, is still at work in the mining camps, but regards the situation as safely past the critical stage; and he is therefore devoting most of his efforts to securing better sanitary conditions in some of the camps.

The epidemic in West Virginia seems to have been, at all times and places, mild compared with that in certain parts of Pennsylvania. If reports are true Wishaw, a town in Jefferson County with 400 inhabitants, has had 78 deaths since Sept. 28. There were probably only four English-speaking families in the little village. The rest spoke Italian and were of that nationality. Of the 400 all but ten were victims of the epidemic.

MUCH ADO ABOUT NOTHING COSTS \$12 A HEAD

As a result of the efforts of Special Umpire Allison O. Smith, representing the Fuel Administration, the dispute has been settled between the McKell Coal Co. and its mine workers at Kilsyth, on the line between Raleigh and Fayette Counties, West Virginia. The difference was as to the hour at which the man trip should leave the outside of the mine. The hour is fixed at 7 a.m. The company and mine workers were at loggerheads about this trifling matter for 30 long days. Every miner was fined \$12 for going on strike in violation of the express terms of the contract.

The influenza has made heavy inroads into the funds of the United Mine Workers in the State of Illinois. In one day recently 19 claims were presented at the offices of the organization in Springfield. The beneficiaries of each member of the organization who dies are paid \$250.

The Illinois organization can stand the drain, however, as it still has \$2,434,841 in the bank. The Illinois district has 95,000 members and is the largest and wealthiest miners' union district in the world. An audit of its accounts which brings the record down to October has just been completed by the district auditors, J. H. Pitman, James Box and Homer Whiteside. It shows that the income of the organization in the district for the preceding six months was \$723,612 and the expenditures \$252,782. The balance on hand at the beginning of the half year was \$1,963,958, to which \$470,884 is added as the excess of income over expenditure for the half year. The largest item in the income tables is that of assessments, which brought in \$612,243.

BIGGEST DISTRICT PAYS OUT BIG MONEY

In the expenditure tables the largest item is death claims, for which \$127,728 was paid out during the half year. For relief and aid \$2154 was paid out. Officers' salaries amounted to \$38,082 and their traveling and other expenses to \$22,325. Field workers' salaries amounted to \$10,317 and their expenses were \$2408.

Of the funded assets of the district \$500,000 is represented by Liberty Bonds. The district has real estate in East St. Louis and Chicago valued at \$139,000. Two thousand dollars are invested in the bonds of township schools.

Numerous loans, some of large dimensions, have been made to related organizations, locals of the district and co-operative organizations. The largest loans are \$100,000 to the Western Federation of Miners and \$100,000 to District No. 6, United Mine Workers. The greater part of the funds are invested in 67 banks, all but four of which are in Illinois. The four outside banks are in Colorado and

hold \$50,000 among them, and this money is guaranteed by the international organization. Six of the Springfield banks have deposits ranging from \$25,000 to \$150,000. The district organization owns only \$830 of war stamps.

Little coal was mined in Illinois on Nov. 11, when the news of the ending of the war came. The mine whistles helped spread the tidings, and the miners, instead of going to the pits, formed in parades and marched through the streets of the town. The suspension was much more general than on the previous Thursday, when a premature announcement was received, because that announcement did not come until about noon and most of the miners were below. When the real news came it was so early in the morning that all the miners knew it before going to work, and so they were able to observe the event. Influenza, coupled with the peace holiday, has greatly cut down the production. At some mines the man power has been reduced 50 per cent. by sickness, death and fright. Many miners are laying off until the epidemic subsides.

ILLINOIS MINERS WANT WAGE READJUSTMENT

With the signing of the armistice some people expect that the Illinois miners will become more insistent in their demands for increased wages. This expectation has given rise to speculation as to whether they will consider that they are bound to still observe the contract which was to run for the period of the war. It is supposed that there will be a disposition to claim that the war has ended, for the purposes of the contract, although peace has not been signed.

From Roundup in Montana word comes of a great shortage of coal miners and other coal mine workers. As a result of the scarcity a much lower production has been mined this year. The consumer will doubtless suffer where he is dependent on the Roundup output. The state director of the United States Employment Service, Scott Leavitt, has been asked to provide the men needed.

A vote of approximately 4300 coal miners in the State of Washington has resulted in Martin J. Flyzik, president of District No. 10; Ernest Nesham, secretary-treasurer, and Sam Caddy, of the international executive board, of the same district, being reelected. President Flyzik is now in the East seeking an increase in wage for the Washington coal miners and the matter will be taken up with President Wilson direct.

LIKE DYNAMITE TO BE HANDLED WITH CARE

On Nov. 7, Burton L. French, a representative from the state of Idaho, introduced into the House of Representatives a joint resolution, No. 342, which was referred to the Committee on Appropriations. It provided for a commission of seven members to be known as the United States Employment Commission, and authorized them to spend a sum of \$50,000 in the making of plans for road building, canalization and improvement of rivers, drainage, reclamation of lands by irrigation or otherwise, reforestation of acres chiefly suitable for forest and other improvements of large community or national interest.

The commission is to report to the President as early as practicable as to the importance of the work planned, the number of men that can be advantageously employed and, as nearly as may be practicable, the kinds and character of labor required and any other pertinent facts.

This is a splendid scheme to cushion the possible blows of reconstruction should any such occur. The plans should be, however, marked "Dangerous! Handle with Care!" for if they go off prematurely or in the neighborhood of pressing business they may do a lot of harm. We must always remember that the work of this committee should be looked upon as merely a safety inlet valve and as such it should not be opened unless the vacuum in the labor market becomes too high. Moreover, there is always the danger that it may develop into the largest pork barrel ever unstaved and disembowelled in our, or any other, history.

On Nov. 19 Frank P. Walsh, joint chairman with W. H. Taft of the National War Labor Board, tendered his resignation to President Wilson.

EDITORIALS

Fighting Publicity with Publicity

VIGOROUS indeed are the attacks made on the coal industry both in war and in peace. Some of its contemners find fault with the financial side of the industry; others attack it from a labor viewpoint. The men and the women who denounce the industry boldly sign their names to their diatribes, usually appending even their given names, and as a result the public gets to know them, to acquire a certain familiarity with them, and is then ready to listen to all they have to say. The people delight in the pungency of their remarks and believe much of what they put into print. How can the readers of their writings do otherwise, for knowing nothing about the industry they have no information wherewith to meet the misstatement. With no one to contradict the traducers of our industry, even anonymously, everybody believes that their arguments are unanswerable.

How much better it would be if there were men in the industry who were as well known to the public as these hireling publicists and who yet acted in the rôle of honorable and conservative protagonists of the coal operators. Should some of the men in the industry thus enter the public eye they could unquestionably remove with success much of the criticism under which the industry rests and prevent the development of the growing discontent.

The public is not to blame if it adjudges that the sullen silence, which the coal industry deems the wiser plan, is the outcome of guilt rather than of reserve.

Some time ago the anthracite operators in council assembled prepared advertisements which were published far and wide. It is not to such publicity that we are referring but rather to written statements of individuals such as are in general known as "interviews." Those who make such statements before long learn just what papers will publish them without unfair modification.

Yet it seems premature to talk about interviews in the daily papers, for operators have scarcely arrived at the point where they will, under their own names, discuss, in the technical press, the problems of industry, ethical or even mechanical. They are afraid to take a stand for fear it will be criticized. The temperately minded, with a few admirable exceptions, will not write even anonymously. Still fewer are the broad minded men who will sign their names to the thoughts they commit to paper.

Thus while the rabid element in the industry is suffered to misrepresent the purposes and ideals of the mining world, the radical element outside the industry makes false and unfair attacks on it. All the while there are none to defend it either from Bourbonism within or Bolshevism without.

If the thoughtful men of the industry would only do their thinking out loud. If they would publish their

conclusions without fear or restraint, we might in a short while arrive at a better understanding. A few false steps might be taken, but no false step is as bad as no step at all. The silence of the industry appears to all the world as ominous. It seems that there must be something to hide when men are so little willing to put their thoughts on print paper.

Coal Industry's Production Manager

THE war being apparently ended it is time to take stock of the big men it has given us. Happy indeed was the chance that lighted on J. B. Neale for production manager. To him we owe a great deal, for it was largely his enthusiasm which brought up the production despite the loss of men to the united services and to the munition works. He truly became a leader in the industry—a vital force in promoting adequate coal production.

Leaders of men are men who can sway moral forces, those qualities in men we too often scoff at and decry; those qualities which, deny them as we may, are the very breath of the nations. Neale believed so firmly in the moral call that he could always appeal to it effectively.

His was no easy task; so hard indeed was it that we still find ourselves greatly wondering how he contrived so readily and happily to perform it. He had to direct two forces who, when they were asked to act in unison, usually ended by scrapping among themselves. The word "production" always held endless possibilities for a purposeless squabble. Somehow, however, Neale managed to harness capital and labor to the national gun carriage as a splendid working team, with the steeds eyeing one another occasionally perhaps, but pulling for all they were worth.

To most men there were two ways in which the work could be done. Neale could have "jollied" both of the contending parties, or he could have been indiscriminately neutral and with foolish words condemned both parties for the follies exhibited by either—a balanced form of denunciation which of late has been all too common. Neither of these courses did Neale take. He would have looked upon mere "jollyng" as the shallow and dishonest concept of a politician, and he would have regarded neutrality as an unworthy trick of a man without convictions.

Instead of taking either stand he used his close-hand knowledge of the coal business in such a manner that every word of blame—and words of that kind were many—were as soon as uttered recognized as just and truly spoken. Instead of blaming both operators and mine workers for the same faults, he singled out their peculiar failings for correction. He made each of them make careful inventory of their failings and record them in black and white. It was no secret confessional either; he would have the outcome of it all posted in

plain sight where all could see how much time and tonnage were lost by the faults of each.

To the credit of both parties, be it said, they took his advice well, and they prepared themselves for the public approval by a diligent and ready self-examination. Mr. Neale visualized for them, as it had never been made visual before, the importance of the work they were doing. He saw clearly just why the tonnage did not reach in full the possibilities which labor supply, opened mines and railroad-car service justified the nation in expecting.

From this man the coal miner and the coal operator got justice, judgment and sympathy. In a rough and ready world neither of the parties get enough of these things. Blame and recrimination are bandied around all too freely. For a while we were allowed each to view himself sanely and honestly, neither extenuating faults nor painting them blacker than they really were nor yet creating them when they did not exist.

With one bound, production and good-will advanced, especially in those places where Neale made his principal appeal. The nation owes him its thanks. He certainly served truly and well, and happy indeed is he who is honored by the opportunity to perform for the nation such a signal service as has been his.

Peace and Waste Are Not Synonymous

THE Hun has been defeated. The war, so far as active hostilities are concerned, is over. The chief purpose for which this country unsheathed the sword a year and a half ago has been accomplished. We rejoice in the belief that the world has been made safe for democracy. It must now be kept secure.

Aside from the main issue at stake—which has been settled by force in France—one of the greatest benefits derived from the war has been the lessons learned in conservation. Americans have learned that certain economies could be made without serious inconvenience. The tremendous sales of liberty bonds and of thrift stamps furnish striking illustrations of what the country as a whole has been able to do in a financial way. But many savings have been made in the shape of fuel and materials that have been quite as important to the country as the huge sums received by the Government.

The world is now entering upon a period of reconstruction in many respects quite as hazardous and crucial as the era of blood through which we have just passed. The present is no time to relax the reins of frugality and thrift, or to abandon the practices that have made victory swift and sure.

Perhaps in no resource have the savings effected in the past few months been more important than in coal. Consistent conservation has long been urged and encouraged by the United States Fuel Administration and other agencies. Some of the results obtained have been highly gratifying. Unfortunately, however, the benefits derived have not received the publicity that their importance warrants.

At the suggestion of the Fuel Administration, therefore, *Coal Age* extends an invitation to its readers to contribute articles or letters setting forth specific cases of where conservation measures adopted have borne fruit. Such articles should be illustrated if possible and should cover among other things the following three

important points: What was done; how was it done; what results were obtained.

No man should "hide his light under a bushel." The needs of the country are now, and will be, as great during the next few months as at any time in the recent past. If you have been successful in your attempts at fuel conservation let your experiences be known that others may be encouraged to follow your example and save coal against the needs of humanity.

What Coal Are You Burning?

THE president says to the manager: "Of course we will burn our bugdust under our boilers." The manager assents, and the order goes forth: "Dump the bugdust cars over the boiler chute." The order is obeyed. Presently a cutter in 20th left complains he has no power for cutting. The motorman in the 6th face reports that he cannot make the hill beyond the swag at 15th right because he hasn't the "juice."

The foreman comes out in hot haste and interviews the engineer in the power house. He blames the boiler-room men, but says they haven't a chance to keep up a brisk fire and a boiler full of high-pressure steam on the bugdust supplied them. Then the foreman changes the orders and says the bugdust must be sweetened with a few cars of lumpy coal, and soon the boiler house gets the cream of the coal and the bugdust goes to market.

Of course, no one reports that the bugdust is no longer being used. It is likely that the president of the company never finds out that fact. The manager makes a few feeble protests, but he finally gives the assent of silence and looks at the coal pile with a blind eye, except on the day when the president is expected. Then he passes a tip to the foreman, and bugdust goes to the furnace, and the mine slacks hopelessly in consequence all along the line.

The only way to prevent this is to put in mechanical stokers that will burn nothing but small coal and will burn it efficiently, while keeping up a full head of steam. Your orders must then be obeyed, for the mechanical stoker doesn't know how to burn anything but the small sizes. Your furnace man doesn't make any objection against his work, for the bugdust is fed by machinery. You save money and get your own way—which is worth something. Nobody will ever get his own way who, with the modern fireman and without mechanical stokers, tries to utilize his bugdust in the generation of steam.

Reestablishment or Reconstruction?

MUCH water has passed over the dam since the war was declared back in 1914. It is gone. We can no longer impound it. Wages have risen, costs also have gone up. These matters cannot well be corrected. The change has done little good to the workingman, but he would not stand to have his wages reduced even nominally. So let the wages alone, and values also.

We have, however, to put back our war workers and our armies into peace industries. But in so far as changes are made, let them be in the nature of reestablishment rather than reconstruction. Now is no time to recast the social fabric. The problems involved in maintaining it are severe enough. Let us have, if you will, a new spirit; but let us not attempt by law to create a new order.

FALLS ON ROADWAYS & TRAVELLING WAYS



An unreported piece of rock falls and kills its man

THE maintenance of traveling ways in a safe condition is primarily the duty of the mine foreman. We all know that he will spare no expense in securing safety when he knows of an immediate danger, but he cannot be at all parts of the mine at all times. A dangerous condition may arise in but a few minutes and each man should feel that it is his duty to give warning as soon as danger is perceived.

Safety work is like many other things in life which are above payment—done for humanity's sake and because we expect as payment that the other man will do likewise. Would you think of waiting till someone gave you a \$10 bill before waking up your neighbor at night if you saw his house on fire? Yet how often will you scoot by a dangerous place and expect the next man to be equally alert and see it.



They scoot by and let the rock fall on the other fellow

Safety letter of a large Coal Company to its men

THIS summer two miners were walking out of the mine to the place where they get on the man trip. One stopped, the other passed on, and at almost that instant a large piece of slate fell, killing one instantly.

Probably a number of men had passed that piece of slate that day. It is hardly possible that no one noted that it was becoming dangerous, but the big thing is that no one felt that it was his particular duty to give it special attention or even to send the word of warning that might have saved a man's life.



Never mind the fire, no one will pay me for reporting it

THIS is where we who work in the mines fail in reciprocal safety, the most important of all safety work. Don't be a safety slacker. We must train and educate ourselves to feel that the other man deserves the benefit of our knowledge whenever we see an immediate danger and that we must not fail to take the few extra steps to warn our fellow employees or at least to get the proper information to those who will either warn them for us or remove the danger.

We all use the manways, we all take a like chance from any danger that exists in them, consequently we should make their safety a coöperative affair. Let us all get together and take a part in keeping them safe so that another accident as above described will be impossible.

Material to be used in and around the mines should be inventoried as received and placed in the supply house, which should be kept under lock and key, and a competent and reliable man placed in charge and held responsible for all material. Every foreman should understand that he must send a written order for such material as he may need. The order must show what material is wanted and to what department it is to be charged, as for example:

STOREHOUSE KEEPER:

Please deliver to bearer:

2 Trolley poles (6 ft.);

1 Trolley wheel, No. 120.

Charge to Electric Haulage.

100 Morgan & Gardner mining machine bits.

Charge to Mining Machines.

(Signed) Bill Jones, Mine Foreman.

Each order when filled should be taken and priced with the average cost of the material, as shown by the invoices. Freight and express should be added to all invoices, unless they are bought delivered. This order should then be filed until the close of that half-month, when a sheet of paper with all the departments shown should be taken and the amounts shown on the orders charged under each head.

I believe this is as simple a system as can be devised and will give an accurate cost of labor and material for each department. A simple perpetual inventory can be maintained as a check against material bought, on hand and used.

The overhead charges shown in the following lines must be left to the operators to distribute as they think best.

OVERHEAD CHARGES

Superintendent.....	.....	.....
Office.....	.....	.....
Insurance.....	.....	.....
Taxes.....	.....	.....
Workman's compensation.....	.....	.....
Royalty.....	.....	.....
Sinking fund.....	.....	.....
Proportion of main office expense.....	.....	.....
Total.....	.....	.....

The yearly salary of the superintendent is generally divided up between the mines and commissary and a certain percentage charged to each department. Insurance and taxes paid each year will be charged off each month or semi-monthly in equal amounts. For instance, \$2400 paid for insurance in a year, would mean \$200 a month or \$100 for a half month. Taxes are to be handled the same way. An average charge for main-office expense must be distributed in like manner.

Workman's compensation is generally carried by every mine these days. The amount actually paid the compensation commission should be entered, less the amount collected from the employees. Where royalty is paid, the amount per ton can be applied against the tonnage produced. Royalty is generally paid on a tonnage basis of 2240 lb. Hence, an output of, say, 10,000 tons of 2000 lb. would equal $(10,000 \times 2000) \div 2240 = 8928.5$ gross tons, subject to royalty. A sinking fund is an amount, per ton, charged off to take care of improvements, etc., and is generally assumed as 5c. per ton. Thus, 10,000 tons @ 0.05 = \$500 charge to sinking fund.

I have made up a card memorandum of accounts, which I think will take care of all the departments shown. I may have omitted some accounts that should

be shown under some of the departments. If so, it will be easy to add whatever is wished to these accounts.

COST-SHEET

The Blank Coal Company, Montgomery, Ala.
For Period Ending Oct. 15 to 31, 1918

Labor	Amount	Cost per Ton	Comparative Cost Last Half
Pick coal.....
Machine coal.....
Contract coal.....
Machine cutting.....
Yardage.....
Inside labor.....
Track.....
Mule haulage.....
Electric haulage.....
Storage-battery locomotive.....
Ventilation.....
Drainage and pumping.....
Timbering.....
Power house.....
Electricians.....
Tipple.....
General outside labor.....
Blacksmith.....
Mine-car repairs.....
Motor repairs.....
Mining-machinery repairs.....
Drum house and incline.....
Monthly men.....
Total cost for labor.....
Materials			
Yardage.....
Track.....
Mule haulage.....
Electric motors.....
Storage-battery motors.....
Ventilation.....
Drainage and pumping.....
Tipple.....
Mine timber.....
Powerhouse.....
Mining-machinery repairs.....
Mine-car repairs.....
General outside.....
Stable.....
Drumhouse and incline.....
Office supplies.....
Total cost of materials.....

The following is a copy of a card index or memorandum for reference, showing classification of items of labor and material in common use.

CARD ACCOUNTS

M-1 Pick Coal (a) Labor paid for pick mining	M-14 Electricians (Labor) (a) Labor provided it is not distributed to work actually done
M-2 Machine Coal (a) Labor paid for machine mining	M-15 Tipple (Labor) (a) Tipple workman (b) Weighmaster (c) Car droppers (d) Pickers (e) Inspectors and car rounders
M-3 Contract Coal (a) Labor paid men who are working for contractor (b) Amount paid contractor after deducting his expenses as shown above	M-16 General Outside (Labor) (a) Timbermen getting mine timber (b) Saw mill operators who saw timber for the mines (c) General repairs on the outside pertaining to the mines (d) Teamsters
M-4 Machine Cutting (Labor) (a) Amount paid machine runners for cutting coal	M-17 Blacksmith (Labor) (a) Labor repairing miners' tools (b) Labor shoeing teams
M-5 Yardage (Labor) (a) Scale, rates for slate (b) Cleaning up slate falls and moving gob	M-18 Mine Car Repairs or Replacements (a) Carpenters (b) Helpers (c) Blacksmiths (d) Labor of oilers or greasers
M-6 Inside Labor (a) Firebosses (b) Mine foremen and assistants	M-19 Motor Repairs (Labor) (a) Electrician and other labor
M-7 Track (Labor) (a) Foreman of track (b) Tracklayers (c) Helpers	M-20 Mining Machine Repairs (Labor) (a) Labor electricians and other labor
M-8 Mule Haulage (Labor) (a) Boss driver (b) Drivers (c) Stable boss	M-21 Drumhouse and Incline (a) Drum runners and helpers (b) Couplers (c) Labor repairing incline, cable, etc.
M-9 Electric Haulage (Labor) (a) Motormen (b) Brakemen (c) Wiremen and bonding	M-22 Monthly Men Salaries (a) Any monthly man's salary who is not charged to any particular department can be charged to this account
M-10 Storage Battery Loco. (Labor) (a) Motor runner (b) Brakeman (c) Labor for charging	MATERIALS
M-11 Water and Ventilation (Labor) (a) Trappers (b) Brattice (c) Pumps (d) Water bailed in cars	M-30 Yardage (a) Any dynamite, powder fuse, etc., used in the mines for which no charge is made
M-12 Timbering (Labor) (a) Labor for timbering	
M-13 Power (Labor) (a) Engineers (b) Firemen (c) Extra labor for repair (d) Electricians' salary	

M-31 Track	M-41 General Outside
(a) Spikes, nails, ties, rails, switches, plates and bolts	(a) Material used for general repairs pertaining to the mines (not house repairs)
M-32 Mule Haulage	M-42 Stable
(a) Mule shoes, nails, etc.	(a) Feed used in feeding teams
(b) Horses and mules replaced	M-43 Drumhouse and Incline
(c) Harness	(a) Cables, switches, rail, ties, spikes, etc., used for repairing
M-33 Electric Haulage	M-44 Office Supplies
(a) Repairs used	
(b) Waste, oil, etc.	OVERHEAD CHARGES
(c) Trolley wire, bonds, hangers, etc.	M-48 Superintendents
M-34 Storage-Battery Locomotive	(a) Proportion of superintendent's salary (part of which should be charged to commissary)
(a) Repairs used	M-49 Office
(b) Power for changing batteries	(a) Salaries of office men (not including payroll clerk, which should be charged to commissary with other help in that department)
(c) Waste, oil, etc.	M-50 Insurance
M-35 Water and Ventilation	(a) Proportion of yearly premium
(a) Brattice cloth	M-51 Taxes
(b) Pumps installed and repairs to same	(a) Proportion of yearly tax
(c) Timber, cement, brick, etc.	M-52 Workmen's Compensation
M-36 Tipple	(a) Amount paid each month less the amount collected from men
(a) Repairs	M-54 Royalty
(b) Installation of new machinery	(a) Amount paid per ton as (10,000 tons @ \$0.08 = \$800 premium paid)
M-37 Mine Timber	M-55 Sinking Fund
(a) Post and other timber used in timbering	(a) So much a ton charged off each month to take care of improvements
M-38 Power	M-56 Main Office Expense
(a) Waste, oil and other supplies	(a) Get the main office to give you an amount which will represent a fair average of your department's expense each month
(b) Installation of new machinery	
(c) Coal used for boilers (this account should not be added until you have found your actual cost per ton, including supplies, labor and overhead)	
M-39 Mining Machine Repairs	
(a) Bits, jacks and other repairs	
(b) New machinery	
M-40 Mine Car Repairs	
(a) Timber, wheels, axles, bearings, nails, bolts and other supplies	
(b) Lubrications	

I sincerely hope this cost-sheet will be found suitable by a good number of practical operators, and particularly would I like to see it discussed in *Coal Age*.

—, W. Va.

A. T. LAMENT.

Hauling Capacity of Locomotives

Letter No. 1—The inquiry of a West Virginia operator regarding the hauling capacity of a storage battery locomotive is an interesting one, and the reply given, *Coal Age*, Oct. 3, p. 660, is all that could be expected from the data given. However, what impresses me as being the most important, in this case, is the possible effect of the substitution of flexible roller-bearing wheels for the plain-bearing wheels with which the mine cars are said to have been equipped.

It is unfortunate, in my opinion, that this operator listened to the advice of his friend and gave up his original idea of replacing the old plain-bearing wheels with those of the flexible roller-bearing type, as he said he contemplated doing. It is my belief that this change of bearings would have solved the difficulty.

PLAIN-BEARING CARS CAUSE EXCESSIVE DRAIN ON BATTERIES

It is stated in this inquiry that the batteries of the locomotive gave out after about six hours' work. Now, when one realizes the great saving of power made possible by the substitution of flexible roller bearings for plain bearings, it is reasonable to suppose that such a change would have gone far toward assisting the batteries to hold out during an entire shift.

Practical tests have shown that it requires about two and one-half times as much power to start a trip of plain-bearing mine cars as it does to start the same trip when the cars are equipped with flexible roller

bearings. It is clear that excessive drains on the batteries are caused by the frequent heavy overloads that occur where plain-bearing cars are used; and this tax or drain shortens the working day of a storage-battery locomotive. Such being the case, it follows that the plain-bearing wheel is really a governing factor in determining the hauling capacity of a battery locomotive.

FLEXIBLE ROLLER BEARINGS EFFECT A SAVING OF FIFTY PER CENT. OF POWER

Allow me to refer briefly to the results of the reliable tests that were made by the manufacturers of flexible roller bearings for mine car wheels. The tests were made in coöperation with a number of coal-mining officials. In one of the tests, it was shown that the drawbar pull of cars equipped with plain-bearing wheels was 24.3 lb. per ton of load hauled on a horizontal track, while that of cars equipped with flexible roller bearings was only 12.8 lb. per ton of load hauled. A similar test made at another time and in another place, before a large assemblage of mining men, gave the drawbar pull, for the plain-bearing cars tested, as 32 lb. per ton of load hauled on a horizontal track, while that for flexible roller bearings, under the same conditions, was 13 lb. per ton of load hauled.

In the first of the tests mentioned, the saving of power was 47.3 per cent., while in the second test it was 59.4 per cent. For all practical purposes, therefore, it can be assumed that the saving of power effected by the use of flexible roller-bearing, in place of plain-bearing wheels, on mine cars hauled on level track, will range somewhat above 50 per cent.

It has been my custom, in comparing these two types of bearings, for the purpose of showing the saving of power by the use of the improved type, to take 28 lb., per ton of load hauled, as the track resistance for plain bearings, and 12.9 lb., per ton of load hauled, as the average for flexible roller bearings, which makes the saving in power practically 54 per cent.

It goes without saying that the actual saving in power would much exceed this average, in a large majority of cases, in practice, as the tests made at the mines on the plain-bearing cars furnished by the companies using them cannot be assumed to have been made under the worst conditions. The cars selected were probably above the average of those in use.

DYNAMOMETER READINGS CAREFULLY CHECKED

In each of the tests mentioned the readings of the dynamometer car and the calculations were checked by the mechanical engineer of the coal company, or other reliable and disinterested person, and can be accepted as being truly representative and reliable. The same dynamometer car is now in the service of the government and its accuracy is undisputed.

One fact that is worthy of consideration is the constancy of drawbar pull, per ton of load hauled, when the cars are equipped with flexible bearings. Owing to the care exercised in the manufacture of these bearings, little, if any, wear takes place for a long period of time. Only recently, I heard a man who is in charge of a mine where the cars are equipped with flexible bearings, say that scarcely any wear could be observed on the axles or bearings that had then been in operation for about ten years.

In the same connection, the statement of J. J. Bumpus, of Sovereign, W. Va., which recently appeared in *Coal Age* [Vol. 13, p. 844] describing the work performed by a 5½-ton storage-battery locomotive, is worthy of note. This machine, it was stated, operated one year on a 3500-ft. haul, with a 3 per cent. grade against the loads, and hauled 125 loaded cars weighing 4 tons each, in a 9-hr. shift, the cars being equipped with roller bearings.

The same locomotive was then used six months longer for gathering cars at the face, before the life of the 48 lead-battery cells expired. During this 18 months' service, the locomotive had taken the place of four mules and three drivers, and was operated continuously, with a total cost for repairs of \$86.45, which does not include the replacing of exhausted battery cells with new ones.

In closing, let me draw attention to the fact that the last instance cited bears a close analogy to the case mentioned in the inquiry to which I have referred. In each case, a storage-battery locomotive is described as operating on a 3 per cent. grade, the statement in the inquiry being that the grade did not exceed 3 per cent. This confirms me in the opinion that the substitution of flexible bearings for the plain bearings in use would have proved equally successful in the instance mentioned in the inquiry, as in the case cited by Mr. Bumpus.

For the sake of argument, allowing the 28 lb. per ton, previously mentioned for track resistance, and 60 lb. for a 3 per cent. grade resistance, making a total of 88 lb. per ton of load hauled, with plain-bearing cars, as compared with 12.9 lb. track resistance and 60 lb. grade resistance, or 72.9 lb. per ton for flexible roller-bearing cars, the difference between the two types then being $88 - 72.9 = 15.1$ lb., per ton of load hauled, the saving in power is $(15.1 \div 88) \times 100 = 17.16$ per cent. It is important to remember that the ease with which flexible roller-bearing cars are hauled up a grade makes them seem to almost "float" over the high spots in the road, and I can recommend this type of equipment without hesitation.

HOWARD K. PORTER.

New York City.

Mining Equipment

Letter No. 9—In reading the many interesting letters on mining equipment that have appeared in *Coal Age* and in answer to the suggestion so often made that coal operators should *pass on* their ideas and not hold back what they have found useful in their own practice, it occurred to me that one little device that has been in use in our mines for some time past might be of interest and help to others.

We are using a No. 3 electric mine locomotive to haul our cars. There are several steep grades on the haulage roads; and many, who have worked under similar conditions, will know what it is to set sprags in 15 or 20 cars and run the risk of having one's fingers caught in the wheels. Then, when the trip has landed in a swag, one must crawl over cars, climb couplings and squeeze between other cars and close ribs, in order to take out the sprags and enable the trip to be hauled up the next grade.

In order to overcome these difficulties, we set to work some time ago and devised what might be called a

"drag slide," which was applied to the last car of the trip when descending a steep grade. This drag slide was a simple affair, costing little, and proving a great success. It takes but a few moments to put on or take off, and is a great improvement over the old method of spragging the cars.

The drag slide is made of two angle irons fitted to slide on the rails. They are long enough to turn up at the front end in the same manner as tippie horns on a dump, and reach back under both wheels. The affair is substantially made and when in use forms a sled on which the rear car of a trip rides. To apply the drag the rear car is uncoupled and pushed back, the drag slide placed on the rails and the car shoved over it and again coupled. A chain can be used to hold the slide in position if this is necessary.

We have found the use of this drag to be of great benefit. It serves to hold the trip straight and steady, which has the effect of reducing the jerks that always occur when a locomotive starts a trip of cars and the couplings take up the play. This reduces the strain both on the cars and on the locomotive. Another benefit is the great saving of car wheels, which are rapidly worn when sprags are used. I have submitted the description of this little device for what it is worth, hoping it may prove of as much value to some others as it has to us.

Crawford, Tenn.

W. T. HALE.

Estimating Percentage of Grade

Letter No. 1—Having read carefully the inquiry of "Mining Engineer," *Coal Age*, Oct. 17, p. 756, in regard to the best method to use in calculating the percentage of grade, and having had considerable experience in this kind of work, in the employ of some of the largest coal companies in this district, let me say that I have always used and been instructed to use the method where the percentage of grade is based on the horizontal distance. I agree with the suggestion that this is a good subject for discussion, because without a thorough understanding of the method used there would be many errors in reading mine maps. My reason for thinking that the horizontal basis is the best method to use lies in the fact that, as most mine maps are made on the horizontal scale, it makes it much easier to determine the grade between any two points on the map. All that is then required to find the grade between two points is to divide the difference in elevation between those points by the distance taken from the map and the result is the required percentage of grade.

MAKES THE WORK MUCH EASIER

Compare, for instance, a case where the other method is used and the per cent. of grade is based on the pitch distance, with one where it is based on the horizontal distance. In studying the mine map, in my opinion, it would be easier for a mine foreman to make a mistake in calculating a grade based on pitch measurement.

In such a case, it would be necessary to first calculate the pitch distance by dividing the distance on the map by the cosine of the angle of inclination. It is right there that one has a possible chance for an error, either in his mathematics or by taking the wrong cosine from the table.

In the former method, in order to calculate the grade, one does not need to use any distances that he himself must determine, because the required distance is given on the mine map and all that he has to do is to make a simple division.

In closing, permit me to say that I think the better method of the two is that where the per cent. of grade is based on the horizontal distance. That is the only method that I have ever used and I believe it is the method where the least chance for error exists.

Plymouth, Penn.

JOSEPH R. THOMAS.

Iron vs. Wood Mine Cars

Letter No. 3—Regarding the question of which is the better, iron or wood cars, for use under all conditions in mines, it is necessary to consider carefully the power employed for hauling. What would be suitable for motor haulage would not necessarily be best to employ in animal haulage, as the strength of the horse or mule must be taken into account. Likewise, in rope haulage, we must have regard to the strength of the rope before deciding in favor of adopting iron cars.

Where animal haulage is employed in a mine, the use of iron cars is almost out of the question, owing to the greater weight of an iron car for the same capacity. Assume, for instance, that a horse will haul four wood cars carrying 2 tons of coal apiece. If the cars weigh $1\frac{1}{2}$ tons, the total weight hauled will be $4(1\frac{1}{2} + 2) = 13$ tons. A good horse or mule working under favorable conditions will be able to handle such a trip and stand the strain for an 8-hr. day and, after a night's rest, be in shape to do the same work the following day.

IRON CARS A HINDRANCE IN ANIMAL HAULAGE

Now, suppose iron cars weighing, say $1\frac{1}{2}$ tons each, and having the same capacity are substituted for the wood cars. A four-car trip, in this case, would weigh $4(1\frac{1}{2} + 2) = 14$ tons. A horse pulling this load would hardly hold out to the end of the shift and would be so fagged out and exhausted that the work would soon tell on him and shorten his period of usefulness.

Again, with the same running gear, these two types of cars cannot be hauled with the same ease. There is a give to a wood car that makes it easier to haul but an iron car is rigid and does not run as readily on the same track. This fact can only be thoroughly appreciated by those who have had experience in hauling both kinds of cars.

Owing to these hindrances, while a good horse can make, say 12 trips a day, hauling four wood cars in a trip, and stand up to the work, if iron cars of the same capacity are used instead of wood it will be necessary to cut the trips down to three cars each, and that would reduce the output of the mine one-fourth. Estimating on 12 four-car trips a day, with wood cars having a capacity of 2 tons each, gives an output of 96 tons. The use of iron cars, in that case, hauling 3 car trips, would necessitate a loss of 24 tons. This fact alone would seem to be sufficient to bar the use of iron cars where animal power is employed for hauling.

With motor haulage, the case is somewhat different. However, even here, the rigidity of iron cars throws a greater strain on the locomotive, and the necessary bumping and jerking, in starting trips, causes more

injury to the cars than where lighter cars are in use. Broken axles are more frequent on iron cars than on wood ones, because of the rigidity of the former. It is, no doubt, true that wood cars are more easily injured and broken in a wreck than iron ones; but they are the simplest and cheapest to repair, at any ordinary mine shop. Suppose, in case of a wreck, 10 cars are so badly damaged that they cannot be used until they are repaired. If these are wood cars, they can probably be put in shape in one or two days and sent back into the mines. On the other hand, iron cars in a similar wreck would be battered in such a manner that it would require several days or weeks to put them in condition for use again. In some cases, it will cost more to straighten out an iron car than to build a new one and such cars must be thrown aside, unless the shop is properly equipped to handle the work.

Much that has been said with reference to the use of iron cars in animal haulage will apply, in somewhat less degree, to rope haulage, whatever system is employed, as the rope will be overtaxed in most cases and may break when least expected and cause a serious wreck. However, this can be largely avoided by the use of heavier and stronger rope when hauling trips of iron cars.

IRON CARS CAN BE BUILT MUCH LIGHTER AND MADE MORE SERVICEABLE

It may seem, from the foregoing, that I am an advocate of the sole use of wood cars in mine hauling; but this is not the case, provided a suitable kind of iron car is brought into service. My experience with iron mine cars is that they are built much heavier than there is any need. It is my belief that an iron car having a capacity of 2 tons should not exceed half this weight when empty. That is to say, the weight of the empty car should not be greater than one-third of its weight when loaded.

In the manufacture of iron cars, I am satisfied that the thickness of the steel shell or body can be less than is ordinarily employed, and that the frame can be constructed of $\frac{3}{4} \times 2$ -in. angle or channel iron, while the axles need not be more than $2\frac{1}{2}$ in. Such a car would not require more than the ordinary size and weight of wheels. The bed of the wagon should be rounded to a half circle.

In my opinion, the repair of this style of iron car would not require much more in the way of shop equipment than is necessary for the repair of wood cars. The repair of iron cars, particularly in wet mines, it seems to me, calls for a well-defined system. The requirements must be closely studied with a view to securing the greatest economy in this work.

My plan would be to number each car and make it a rule that 10 cars should be sent out every Saturday and given a good coat of hot coal tar reduced to a thin liquid. This should be applied inside and out, alike. The nuts of all bolts should be on the inside of the car, so that none but mushroom heads would appear on the outside. The corners of the car should all be rounded so as to reduce the tendency of the iron to catch anything in its way. Where such a car can be furnished, I believe it would prove more serviceable than a wood car when power is employed for hauling.

Perryopolis, Penn.

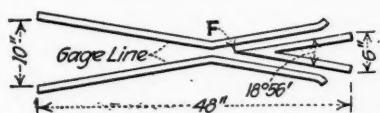
R. W. LIGHTBURN.

INQUIRIES OF GENERAL INTEREST

Mine-Switch Calculations

I have been a constant reader of *Coal Age* for some time past and have noticed many articles and questions asked in its columns, regarding tracklaying, turnouts and switches in mines. These have always been of interest to me, and I have frequently made use of the information thus gained, in my work in the mines.

Recently, we have had some argument on the lengths of lead rails and latches required for a frog laid in a turn-out, near the shaft bottom. In order to make the case clear, I have drawn the inclosed sketch of this frog which, by my way of figuring, is a No. 3 frog. As shown in the sketch, the frog is 48 in. long, out to out,



COMMON FORM OF RAIL FROG

and has a spread of 10 in. at one end and 6 in. at the other end, the spread being measured between the gage lines of the rails. As I understand it, the "lead rail" is the curved rail running from the point of frog, marked *F* in the sketch, to the point of switch, which is the point of the latch in the main road.

The track gage, in our mine, is 42 in., and the length of the lead rail, as measured, is 21 ft. 9 in. I want to ask if this is the correct length for this rail. I have calculated the frog angle as $18^{\circ} 54'$. My method of calculating the number of a frog is to divide the length of the frog, out to out, by the sum of the spread of the rails at each end of the frog, which gives for the frog number, in this case, $48 \div (6 + 10) = 3$. We shall watch with interest for the reply, as we are anxious to know what is right.

TRACKLAYER.

—, Ill.

The method of finding the number of a frog, as described by this correspondent, is correct. The frog is a No. 3, rail frog. The length of lead rail, or the curved rail extending from the point of frog *F*, to the point of switch or the point of the latches in the main road, is calculated, as has been frequently explained in *Coal Age*, by multiplying twice the track gage, in feet, by the number of the frog. Thus, for a track gage of 42 in. or $3\frac{1}{2}$ ft., the length of lead rail is

$$l = 2gn = 2 \times 3\frac{1}{2} \times 3 = 21 \text{ ft.}$$

The length of the latch required will depend on what clearance is desired between the hinge of the latch and the gage line of the main rail. Thus, expressing all dimensions in feet, the length of the latch is equal to the square root of the product of twice the radius of the curve and the desired clearance. The length of radius (*R*) of curvature of the lead rail is found by multiplying the length (*l*) of the rail by the frog number (*n*), which gives, in this case, $R = ln = 21 \times$

$3 = 63$ ft. Finally, calling the length of the latch *x*, the radius of the curve *R*, and the desired clearance between the latch and the main rail *d*, we have for a clearance of 3 in. or $\frac{1}{4}$ ft., in this case,

$$x = \sqrt{2Rd} = \sqrt{2 \times 63 \times \frac{1}{4}} = 5.61 \text{ ft.}$$

For a clearance of 4 in. or $\frac{1}{3}$ ft., the length of latch is

$$x = \sqrt{2 \times 63 \times \frac{1}{3}} = 6.48 \text{ ft.}$$

Portable Coal Loaders

I am writing to ask for any information that *Coal Age* can give me, in regard to a portable machine for loading coal at the working face. We are mining a 9-ft. seam of coal and I am desirous of installing a machine that will load this coal to the best advantage, with regard to economy and ease of handling. The different types of conveyor belts that I have been considering do not appeal to me as suitable for handling and loading the coal, in our case. In one instance, the belt was only 12 in. wide, which is much too small for our purpose. Any suggestions that *Coal Age* can offer that will assist in solving our problem will be greatly appreciated.

Rugby, Colo.

OPERATOR.

From the statement in this inquiry there is some doubt as to the kind of loading equipment desired by the correspondent. There are a number of chain, belt and scraper conveyors now on the market. These are mostly designed for transporting the coal along the working face to the roadhead where it is dumped or loaded into the mine cars to be hauled out of the mine. The different types will be found advertised by their manufacturers, in the advertising columns of *Coal Age*, each type having its peculiar advantage and adaptation to varying conditions.

As a rule, all kinds of face conveyors are designed and adapted for use in the working of thin seams of coal where the mine cars cannot be taken along the face to be loaded. Such conveyors are particularly adapted to longwall work, where the roadheads are often 100 yd. apart, affording a good opportunity for the operation of the conveyor.

In a 9-ft. seam of coal, as in this instance, it would seem that a coal loader of the Myers-Whaley type, which was described in *Coal Age*, Oct. 10, p. 711, would be well adapted to the work. This machine is both a shoveler and a loader and has been found to work very successfully, shoveling the coal from the bottom, elevating, transporting and dumping it into the mine car at hand. The machine is portable.

Another light and portable coal loader is that manufactured by the Jeffrey Manufacturing Co., which differs from the one just mentioned by requiring the coal to be shoveled into the conveyor by which it is transported and dumped into the mine cars standing close at hand. Any of these types of loaders are recommended as giving good results under varying conditions.

EXAMINATION QUESTIONS

Miscellaneous Questions

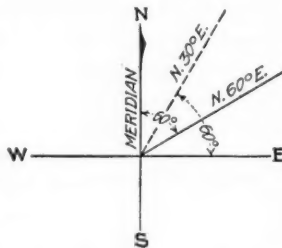
(Answered by Request)

Ques.—Under what conditions is it safe for men to enter return airways contaminated by gases emanating from a mine fire?

Ans.—No one should be permitted to enter a return airway that is filled with gases generated by a mine fire, unless he is protected by an approved form of breathing apparatus. There is always a large amount of carbon monoxide produced by the fire, and this gas is very poisonous and may produce instant death if present in sufficient proportion in the air current.

Ques.—What is the difference between north 60 deg. east and 60 deg. north of east?

Ans.—As shown in the accompanying figure, a line having a bearing of N 60° E makes an angle of 60 deg. to the right of the meridian, facing in a northerly direction. On the other hand, the direction or bearing described as 60 deg. north of east would indicate that the line makes an angle of 60 deg. with a due east line, the angle lying on the north side of the line. In the figure, the bearing first named is indicated by the full line, while the dotted line represents the second bearing named. The true bearing of this second line should be expressed as N 30° E, instead of 60 deg. north of east.



ILLUSTRATING BEARINGS

Ques.—What should be the daily procedure of a mine foreman?

Ans.—The foreman in charge of a mine should be on hand at the shaft or slope bottom when the men are about to enter the mine for work. His first duty is to inspect the report of the fireboss or firebosses who have examined the mine that morning, and see that it is reported safe. The foreman must note what dangers have been found as stated in these reports, and give instructions to his men in regard to removing such dangers and making the places safe for work. The foreman should withhold the checks of any miners whose places are reported unsafe for work.

After starting the miners and instructing the company men in regard to their work, the foreman must give his attention to the hoisting of coal and the work of the drivers. In making his daily rounds, the foreman must see that the working places are properly ventilated and timbered. He must examine carefully the roof in each place and give the miners any needed instructions regarding their safety. The foreman must see that all roadways and air-courses are properly timbered and safe. He must also examine all abandoned and void places in the mines and see that they are free from accumulations of gas and other dangers.

In addition to these duties, the mine foreman must attend to the needed supplies of material and order whatever is necessary for the operation of the mine. At the close of the day the foreman must ascertain that all of the men have left the mine. The foreman is responsible for the mine being operated in compliance with the mine law. He must see that the rules and regulations of the mine are obeyed and discipline men guilty of any violations.

Ques.—What conditions would guide you in determining the size of pillars in mine workings?

Ans.—The conditions affecting the size of mine pillars are the following: The nature, character and depth of the overlying strata; the quality, thickness and inclination of the coal; the nature of the floor or underlying strata; the size of openings and method of working employed; the time that must elapse before the pillars are to be drawn; and the presence of water or gas in the seam or contiguous strata.

Ques.—State what, in your opinion, would be considered as a main door.

Ans.—A main door, in mine ventilation, is a door separating the main intake from the main return airway. Any door leading from the main intake airway into another airway or section of the mine is also rightly called a main door.

Ques.—How would you distinguish between a rupture of an artery or a vein, where the victim is bleeding profusely? What steps would you take to protect the life of the victim?

Ans.—The blood coming from a ruptured artery will have a bright-red color and issue in spurts or jets, corresponding to the throb of the heart. On the other hand, blood flowing from a vein will have a darker color and issue quietly without spurting. In the former case, expose the wound so as to locate the point of rupture and apply a bandage so as to press tightly on the artery, between the point of rupture and the heart. This will check the flow of blood from the wound and give opportunity for the blood to form a clot at the opening. In applying such a bandage, a tourniquet should be used to insure a sufficient pressure on the artery and check the flow of blood from the wound.

In the case of a ruptured vein, remove any tight wrapping that would prevent the free flow of blood back to the heart and apply a bandage directly over the wound, which will assist the formation of the clot of blood and stop the flow at that point. In any case of serious bleeding, send for a doctor at once.

Candidates are constantly asking *Coal Age* to answer the questions asked in their state examinations. Examining boards are requested, therefore, to forward to *Coal Age* copies of the examinations, as soon after the examinations are held as possible. This will prevent mistakes, which are often made by candidates sending incorrect questions with requests for answers.

COAL AND COKE NEWS

What Happened in October

[The bracketed figures in the text refer to pages in the present volume, and should the reader desire further information he can obtain it by reference to the pages indicated.]

- Oct. 3—Meeting of Anthracite Conciliation Board with union men and representatives of the Fuel Administration is held at Washington, D. C., the purpose being to consider whether the need for labor in the anthracite region furnished sufficient reason for a readjustment of wage which would bring the rate paid more nearly in accord with that in effect in bituminous mines and munition factories. [703]—C. E. Persons appointed Director of Education of the Fuel Administration [699]—Special maximum price set for coal of Loony Creek Coal Co., in Harlan County, Kentucky [744].
- Oct. 4—Special maximum price set for coal mined by Montevallo Mining Co., in Alabama [744].
- Oct. 7—Gladstone and Michel mine workers in Calgary field, British Columbia, vote to return to work under provision, of Sept. 27, of Dominion Director of Coal Operations [748]—Plant of Pike Coal Co. near Petersburg, Ind., is destroyed by fire [760]—Special maximum price set for coal of Southern Ohio Coal Co., Starr Township, Hocking County, Ohio, and for coal of Alliance Coal Co., Colorado.
- Oct. 8—Conference of mine workers and mine operators of the anthracite region with Fuel Administrator Garfield consider data telegraphed from mining field relative to wage rates.
- Oct. 9—Conlon mines fall in and cause much damage at Plains in anthracite region of Pennsylvania.
- Oct. 11—Attempt is made to burn the tipple of the Panama Coal Co., near Moundsville, W. Va. [800].
- Oct. 12—Fourth Liberty Loan drive commences [654, 704, 750]—Announcement is made of the Anthracite Wage Agreement as proposed and accepted by the wage board but not yet made operative [701, 703, 705, 789]—Main office of Thomas Colliery Co.'s mine operated by Madeira Hill Coal Co. burns down [800].
- Oct. 13—Fourteen bodies are recovered from the north mine of the Franklin Coal and Coke Co., at Royaltown, Ill., victims of the fatal explosion of Sept. 23 [714, 760].
- Oct. 16—United States Fuel Administration authorizes an increase in the reserve stocks of coal held by all classes of consumers except Class 1 east of the Mississippi River.
- Oct. 18—Announcement is made that the United States had offered to place at the disposal of the Dutch government 100,000 tons of coal monthly till the end of the war on condition that food be not sent to Germany [800, 827, 865].
- Oct. 20—Miners worked in large numbers in an endeavor to maintain production in face of influenza epidemic.
- Oct. 24—New agreement in Vancouver Island, B. C., with wages increased 75c a day with a sliding scale to adjust wages to cost of living [868].
- Oct. 25—W. D. Tyler appointed Acting Director of the Bureau of Prices, vice E. Q. Trowbridge, who resigns for army service.
- Oct. 26—Dr. H. A. Garfield, United States Fuel Administrator, announces that "the Fuel Administration approaches the winter season well organized with stocks of coal on hand far in excess of the stocks of other years"—Trade paper editors leave United States for Great Britain as guests of the British Bureau of Information [921]—New maximum prices set for coal mined by certain corporations in Bell and Harlan counties, Kentucky, and Wise County, Virginia, are made by United States Fuel Administration.
- Oct. 28—United States Fuel Administration closes 13 small mines producing dirty coal [865].

Oct. 31—New anthracite wage scale as forecast Oct. 12 is made operative by the United States Fuel Administration [789, 867].

Harrisburg, Penn.

Coal companies must pay for the care of injured miners sent to hospitals, according to a decision of Judge Woodward in the suit of the trustees of the State Hospital of the Middle Coal Fields against the Lehigh Valley Coal Co. The dispute was presented to the court in the form of a case stated, and Judge Woodward of Luzerne directs that judgment be entered in favor of the plaintiff for \$1,166.68, for the board and treatment of certain injured patients, who were employed by the defendant company. The case decides a question raised under the Workmen's Compensation Act.

Before the compensation act there was no obligation on the part of the employer to furnish treatment to the injured employee. So that if the employee went to the State Hospital the contract for treatment was between the hospital and the employee, and the purpose of the act, the court states, was to relieve the injured employee from the burden of payment. Before the Workmen's Compensation Act, if the employer had sent his employee to the State Hospital there would have been nothing to prevent his becoming responsible for his treatment, if he so stipulated. The compensation act now stipulates for him that he will be responsible if he sends his employee for treatment.

The court further states, "If on the other hand the employer had absolutely refused to furnish treatment, or had not been consulted, and the employee being a mine worker had gone to the hospital on his own account, the plaintiffs could not collect, because there would have been no privity of contract between the plaintiff and the employer, but only between the plaintiff and the employee, whom they could not charge for service; and as the compensation act only requires the employer to reimburse the employee for what he has spent for service, there would be nothing for the employer to pay."

The court contends that the obligation to pay in this case does not arise from that part of the compensation act which specifically requires the defendant to pay something, because the payment referred to is made to the employee and not to the person and institution rendering the service; but it arises from the obligation to procure treatment which was not on the employer before, and when the treatment is furnished the law creates the obligation to pay. The act creates the privity of contract which did not exist before, and the common law creates the obligation to pay a quantum meruit up to the limitation fixed by the compensation act. The State Hospital act does not prohibit the receiving of compensation except from the injured mine worker.

Uniontown, Penn.

Signing of the armistice will have no immediate effect upon the regulation of the coal and coke industry in the Connellsville region other than increase the difficulties of fuel officials in preventing the rank and file of the workmen from relaxing their efforts. Operators generally are inclined to welcome government supervision until the industry had readjusted itself to a peace-time basis. With the passing of the war appeal, however, a problem is presenting in retaining maximum efficiency among the workers to maintain tonnage at the high peak required to meet present demands. Definite policy in that regard has not yet been formulated.

Another low level was touched in production for the week ended Nov. 9, figures issued by the fuel administration placing the output at 610,604 tons of coal, of which 416,767 tons was manufactured into 277,849 tons of coke and 193,837 tons was shipped to byproduct plants and other industries. The figures in the aggregate represent a drop from the previous week of 44,600 tons and a decrease of 138,784 tons

from the high record of Oct. 12. Coke dropped 17,711 tons and coal 22,500 tons. General peace demonstrations and influenza, which has not disappeared by any means, is blamed for the continued drop.

Three days after the effectiveness of the Pennsylvania Railroad order discontinuing box-cars to team-track loaders, no orders have been placed at the division office here for open-top cars by that class of operators, leading to the assumption that the team-trackers, as a class, had carried out their threat to discontinue operations. There were 155 of those operators served by the Pennsylvania R. R. with a daily rating of 175 cars, making a daily average output of 4275 tons. With the reduced price of 75c. per ton for coal loaded in open-top cars, the team-trackers claim they can make no profit. In addition there has been a decided slump in that grade of coal and instances have been reported of sales below the Government price.

Dissolution of the J. V. Thompson creditors' committee, a body established two years ago to protect interests of unsecured creditors with claims of \$13,000,000 against the former coal baron, is asked in a petition in equity filed in the Fayette County courts by a number of creditors. An accounting of their management of the estate is also asked.

Sweeping charges of inactivity by the committee are made to support the plea for its dissolution, the claim being made that Thompson has at all times dominated its policy. The fight for the control of the Thompson Connellsville Coke Co., which has been pending here for several months, is also referred to in the equity bill. The charge is made that the sale of securities pledged with the First-Second National Bank of Pittsburgh as collateral was made to J. H. Hillman, Jr., at an inequitable price. The transaction, which included 5750 shares of stock in the Thompson Connellsville company and other securities, the petition avers lost to the Thompson estate a sum "in excess of \$300,000."

Birmingham, Ala.

Greatly increased coal production in Alabama and the Birmingham district is shown in the figures for the week ending Nov. 2, when the output amounted to 347,557 tons. Operators and miners are being urged to push their activities to the utmost, to obtain maximum production during the remainder of the year. The fact that the war seems to be about over will not slow up the developments now being pushed in the mining sections of the district. Notable among these are those of the Republic company at Palos, the Tennessee company at Getmore, in the Blue Creek region, and the Woodward Iron Co., near Dolomite. These mines are on a large scale and will produce upward of 20,000 tons per day each when in full operation.

The transportation companies in the Birmingham district are moving equipment as quickly as possible and the tonnage being reported shows steady increase. The intra-district business is also picking up, as the passing of the influenza epidemic has brought about improvements in the outputs of coal mines, coke ovens, furnaces, steel plants, foundries, machine shops and other industrial plants.

The announcement during the past week that the Birmingham Southern R. R., a subsidiary of the Tennessee Coal, Iron and Railroad Co., was losing its identity as a common carrier means the elimination of switching charges, brings about the right to charge demurrage and does away with many complications that heretofore existed. When the transportation charges deal now with the Birmingham Southern R. R., they deal directly with the Tennessee Coal, Iron and Railroad Co.

Warrior River transportation plans are still being carried forward rapidly, and with a favorable report at Washington last week by Assistant Director General of Railroads Tomlinson, in charge of inland waterways, early operation of the full resources of the system is expected. Advice from Washington states that Director General McAdoo may journey to Alabama next month to inspect the Warrior and act on the recommendations of Mr. Tomlinson.

Charleston, W. Va.

Pronounced improvement in production was made possible in the Fairmont region during the week ending Nov. 9 through a well maintained car supply covering practically the entire week, the mines in the district being able to rely upon about 1400 cars a day. Delivery of empties to the mines was also more prompt, although on one day cars were late in being placed. With less sickness among the miners more men were available for work. In one or two places only were operations crippled by the prevalence of influenza.

Little progress was made at the beginning of November by the mines of the Tug River and Pocahontas regions in meeting the quota of 2,000,000 tons assigned to those mines by the Fuel Administration as their goal for November. As a matter of fact production had fallen off considerably, dropping from 464,000 two weeks ago to 412,000, a difference in weekly production of over 50,000 tons. Production loss for the week was 63,855 and of that total inability to secure sufficient man power cost 41,596 tons. Production officials express the opinion that influenza kept a good many miners away from the mines. Car shortage had little to do with the decreased output but mine disability cut down the amount produced to the extent of over 11,000 tons. There was also a reduction in the tonnage of coke production, the amount being slightly in excess of 48,000 tons.

Conditions following the influenza epidemic in the New River field have made it difficult to command the full strength of the miners in that field, sickness alone having cut down the output at least 15 per cent. A number of miners remained at home for election day and premature announcement of an armistice also caused many to leave the mines to celebrate. While the production figures for the week ending Nov. 9 show a decrease for that period of 1499 gross tons, the total output being 128,260 tons, it is said that there has really been an increase owing to the fact that certain New River mines were classified in the wrong district.

There was a further decrease in the output of Winding Gulf district for the week Nov. 9 of 2087 gross tons, the gross tonnage produced during the period named being 102,005. Influenza, lack of sufficient power and election day absences caused the curtailment of output, but conditions in the Gulf district are said to be improving.

Lack of power again operated to limit production in the Kanawha mine field during the week ending Nov. 9, sickness to a limited extent also affecting production. The increase amounted to only 727 tons, the tonnage produced being raised from 162,097 tons for the previous week to 162,824 tons. Of the total loss of time, power shortage and other mine disability was responsible for 585 hours. Car shortage was down to a 12-hour loss, while a shortage of man power entailed a loss of 1894 hours.

Victoria, B. C.

The British Columbia Court of Appeal has handed down judgment in favor of H. W. Treat and his associates as against the Esquimalt & Nanaimo Railway Co., in the suit brought by the latter to have the defendants, Messrs. Treat, et al, declared trespassers on certain coal-bearing lands on the foreshore of that block of land known as the Esquimalt & Nanaimo Land Belt, Vancouver Island. This confirms the opinion of the lower court and affirms Mr. Treat's title to the lands in question, which are situated near the mouth of the Chehalis River between Victoria and Nanaimo, B. C. It means that the courts hold the view that the Dominion Government had no power to convey foreshore rights to the Railway company when bonusing it, by a considerable land grant, for the construction of the road. It means, also, that the development of the coal in question will proceed without interference and that others, holding Provincial licenses to coal areas on the foreshore of the Island and within the belt, probably will take steps leading to the development of this part of the coal resources of the Island.

New York, N. Y.

Believing that trouble would be caused by the sudden discontinuance of the National Fuel Administration, the officers and executive committee of the National Retail Coal Merchants' Association have adopted a resolution, which has been transmitted to Dr. Garfield, asking that for the best interests of the retail trade the Fuel Adminis-

tration, as at present constituted, should, in any event be continued at least until Mar. 31, next. Under the present law the Fuel Administration ceases to exist as soon as peace is declared.

A resolution was also passed and transmitted to Dr. Garfield asking that the present prices for bituminous coal and the steam sizes of anthracite be made the minimum prices up to Apr. 1, next, and that the zone system be continued. This action was taken because of the great stocks of bituminous coal stored throughout the west (1,000,000 tons being stored in Chicago alone, most of which is low-grade Illinois and Indiana coal), and that because of the decrease in the demand and increase in production, the dealers are threatened with tremendous losses, especially if the zone system be not continued and high grades kept out until this coal has been disposed of; and also unless price protection is given by the Fuel Administration. To some extent the same situation regarding the steam sizes of anthracite exists in the East.

Other matters discussed were the establishment of the uniform tons of 2000 lb. throughout the United States; the resizing of anthracite coal; the exact definition of what constitutes retail dealers, with a view to having distribution confined to such; the establishment of a Trade Relations Committee for bringing about closer cooperation between the dealers and the operators; and the creation of a committee for the betterment of conditions regarding shipping, weighing, reconsignments, etc.

PENNSYLVANIA

Anthracite

Beaver Meadow—The coal operators of this district have launched a movement to recruit their labor forces for next winter among the farmers of the region.

Pottsville—Two pieces of real estate in the neighborhood of Lawton's Hill and Mill Creek were conveyed to the Lehigh Coal and Navigation Co. They will be a part of the real estate in this city and East Norwegian Township, recently acquired by the company.

Pottsville—The Darkwater Coal Co., near St. Clair, will increase its output of coal by the opening up of new stripping operations. The company has called upon the Pennsylvania R.R. for an increased number of cars to transport the output and guarantees to fill 18 or 20 each day.

Wilkes-Barre—The mine foremen and the firebosses in the anthracite coal fields may soon become affiliated with the United Mine Workers of America. A booster meeting is being planned for this purpose. A few months ago more than 200 of these petty mine officials organized a union and appointed a committee to apply to the American Federation of Labor for a charter. Since that time the enthusiasm and profits that might be gained from such a union spread through the district and it is learned from reliable source that 90 per cent. of the foremen and firebosses are willing to come into the new organization.

Hazleton—Coal operators of the Lehigh coal field are protesting against the new coal rates which allow \$1.05 per ton advance on domestic sizes to cover the increase given the miners effective Nov. 1. It is claimed the wage boost has added 75c. a ton to the cost of producing anthracite, but that \$1.05 per ton permitted on each ton will be only 65 to 70c. when spread over the total output. This is due to the fact that the fuel administration allows the higher price only on domestic sizes, covering 70.6 per cent. of the hard coal tonnage, while on the smaller grades, comprising 29.4 per cent. of the output, no raising of rates will be permitted.

Lykens—The Lykens valley mining region of the anthracite field will show a loss of hundreds of thousands of tons of coal, according to a report of Charles J. Frice, state mine inspector in this district, as a result of the influenza epidemic. In Williamstown it is reported that there were 42 deaths in a population of 5000, while in Tower City there were 115 deaths in 6000 population. In Lykens and Wilcosco there were 53 deaths with a population of about 5000. Several of the collieries were actually shut down for from three to four days a week by the epidemic and the production of anthracite of a high grade, ordinarily 7000 tons a day, went down 50 per cent. for the October working days.

Bituminous

Charleroi—The Dawson Coal Co. has been granted a permit by the United States Government to construct a coal tippie and drive piling on the right bank of the Monongahela River, opposite Millsboro in the river pool.

Uniontown—Development of 140 acres of the Sewickley vein of coal underlying the Fisher farm in Westmoreland County is to be commenced immediately following its purchase here by Miller Brothers, custom coal operators.

Yukon—The tippie and barn of the Yukon Coal Co. were destroyed by fire recently. It is believed that the blaze was of incendiary origin. The damage is about \$15,000, partly covered by insurance. The mine employs about 50 men.

Brownsville—The steamer "Alicia," owned by the W. Harry Brown interests, has been returned to the Monongahela River trade after having been extensively repaired. The steamer was caught in the ice jam last winter and sent to the bottom near the Alicia works of the Brown interests.

Charleroi—The Carnegie Steel Co. has commenced work on the construction of a new marine ways on the Monongahela River, near here. The ways are being built to care for the increasing fleet of steamers and steel craft the Carnegie Steel Co. is developing to deliver coal to the Clairton byproduct plant.

Greensburg—A. Mitchell Palmer, alien property custodian, has taken over 421 acres of land in St. Clair township, title to which was held by the Deutsche Bank, a financial institution in which the Hohenzollerns are said to be heavily interested. The lands involved are said to be a mountain timber tract, underlaid with two seams of Freepot coal.

WEST VIRGINIA

Logan—Among other improvements made by the Shamrock Coal Co. at its plant near here has been the installation of a new substation under the direction of J. B. Agee, general manager.

Dorothy—The Western Pocahontas Fuel Co. is making arrangements to install a tube for the purpose of conveying crushed coal from its mine to the yard bins at Dorothy. The executive in charge of operations is C. E. Sandberg.

Logan—After having been compelled almost to suspend operations because of the prevalence of influenza among its miners, the Gay Coal and Coke Co., of which H. S. Gay, Jr., is general manager, is now able to operate at about half its normal capacity.

Cora—Extensive improvements have been made by the Standard Island Creek Coal Co. at its Cora plant. The company in addition to opening another mine and buying much additional mining machinery, has also installed a new motor generator set. All company houses have also been given a coat of paint.

Holden—Just as soon as they can be delivered a battery of two 400-hp. boilers will be added to the power equipment of the Island Creek Coal Co. at its Holden plant. The company has also arranged for new equipment at its No. 3 mine. The general manager of the Island Creek Co. is A. R. Belsel.

Logan—The new tippie of the Wood Coal Co. at its Ethel plant, used in connection with both Mine No. 1 and Mine No. 2, represents an expenditure of \$40,000. Not only has the company built a new tippie but it has added much new equipment and has just completed the construction of 65 miners' houses. All improvements have been made under the direction of L. R. Howell, superintendent.

Affinity—The program of betterments at the Affinity plant of the Pemberton Coal and Coke Co. includes a new brick power house, a machine shop, the installation of a 300-kw. alternating-current machine, and a 150-kw. direct-current machine, together with a new battery of boilers. The company will also install a water-purifying plant. The betterment program also includes the construction of a number of houses for miners, in addition to an amusement recreation hall.

OHIO

Zaleski—The Chieftain Coal Co. has opened a new mine on the Baltimore & Ohio near Zaleski. The property consists of 236 acres of No. 8 coal about 4 ft. thick. The Chieftain Coal Co. is backed by the same interests as the Wheeler & Mason Co., of Columbus.

Murray—The Owl Creek Coal Co., chartered with a capital of \$36,000 by E. W. Davis, Vance Webb, Charles Schultz, Lewis Green and J. W. Green, has purchased the operating mine of the Carbon Hill Coal Co., near Murray, which was owned by E. A. Cole & Co., of Columbus. The mine has a daily capacity of 400 tons.

ILLINOIS

Du Quoin.—The Jewel Coal and Mining Co. is sinking a shaft 1 mile southeast of this city. The operation will be completed within 60 days and will have a capacity of about 500 tons daily. The company intends to serve the local trade and ship all surplus by rail to various points. Locomotives and mining machines will be installed eventually.

Tower Hill.—The Tower Hill coal mine has closed down permanently. About 1303 miners have been thrown out of work and most of them will remove to other mining centers. The mine has been operated this summer at a financial loss. Owing to the semi-plastic condition of the soil, the entries of the mine have been squeezed out and the two principal entries have been lost by this means. With the condition growing worse, the permanent closing of the mine was the only recourse. The Tower Hill Coal Co. has been conducting the mine since its purchase from the original Century Coal Co., except for a closed period of a year or so prior to its reopening more than a year ago.

MONTANA

Belt.—Arrangements for the development of a new coal mine in this district are being made by a company in which Senator J. M. Burlingame and other Great Falls men are interested.

Foreign News

Nanaimo, B. C.—Coal miners on Vancouver Island are now receiving their first checks under the recent increase in wages of 75c. per day. The wage scale will henceforth be adjusted every three months in accordance with the cost of living.

Victoria, B. C.—Some of the coal deposits of Northern British Columbia are being developed, that which now is receiving attention being the Telkwa Coal Basin, situated about 35 miles from Telkwa on the line of the Grand Trunk Pacific Ry. Three drill holes have been sunk, and, according to the engineer's report, it has been established that there are 50,000,000 tons of good bituminous coal available in this particular section. Experiments seem to indicate that it will prove to be good coking material, but the coal has not yet been given a practical trial. The most serious difficulty confronting the promoters is the question of transportation, the construction of a branch line connecting with the Grand Trunk Pacific being necessary. This is a matter which is being dealt with now and, if the financial support necessary for the work is secured, this coal will be exploited.

Personals

Samuel Mottishaw has been appointed manager of East Wellington No. 1 mine, operated by the British Columbia Coal Mining Co., vice James Gray.

George Crossland has resigned his position as superintendent of the Briar Hill Coal Co. and accepted the position of superintendent for the Anow Coal Mining Co., near Windber, Penn.

Edward H. Cox, of Pittsburgh, Penn., has resigned his position as general superintendent of the United Coal Corporation, effective when his successor is appointed. His successor has not yet been named.

J. T. Morris has been appointed assistant general manager of the Pemberton Coal and Coke Co., with headquarters at Affinity, W. Va., and will have charge of a number of improvements to be made there. Mr. Morris has been the superintendent of the Stotesbury operation of the E. E. White Coal Co.

William Walker, formerly overman at No. 5 mine, Comox Colliery, operated by the Canadian Collieries (D) Ltd., has been appointed manager of the same mine, succeeding **J. W. Montgomery**, resigned. **Robert Brown**, formerly overman at No. 7 mine of the same colliery, has been transferred to No. 5, succeeding Mr. Walker.

George H. Barker, vice president of the Maynard Coal Co., of Columbus was made chairman of the foreign trade committee of the National Coal Association at a recent meeting in Washington, D. C. Recently the directors of that organization met to map out action on export business after the war is over and Mr. Barker was selected for the important post.

Obituary

Louis Lyman LaClair, aged 36, superintendent of the Martin plant of the McKeeffrey Coal Co., died at his home in Martin, Penn., following an illness of pneumonia. He had been connected with the McKeeffrey Coal Co. since 1905.

David Alexander, mine foreman of No. 10 colliery of the Pennsylvania Coal Co., died of pneumonia on Nov. 11 at his home in Pittston, Penn. He was 53 years of age and was one of the best known mining men in the Wyoming region. He leaves a widow and two sons.

P. F. Caten, one of the members of the National Board of the United Mine Workers of America, is dead of influenza, having succumbed at his home at Bancroft, Putnam County, West Virginia. Mr. Caten was one of the leading spirits in organizing the Clarksburg and Fairmont mining region for the United Mine Workers.

Archibald R. Henly, aged 32, of Scranton, Penn., a prominent consulting engineer of mines, died on Nov. 12 of typhoid fever at the home of his mother-in-law in Lansford. He is survived by his wife, his father, and several sisters and brothers. Mr. Henly was a graduate of Lehigh University and until six months ago was chief mechanical engineer of the Delaware & Hudson Coal Co., resigning to engage in business for himself. For several years Mr. Henly was connected with the Lehigh Coal and Navigation Co. and with the Lehigh Valley Coal Co. in the engineering divisions.

Industrial News

Spokane, Wash.—Local coal dealers report that the retail situation this winter is more promising than ever before as the greatest majority of the home owners have put in their winter's supply and the dealers have much coal in storage.

Mansfield, Ohio.—The Ohio Brass Co. announces that on Nov. 15 it moved its New York City office from 30 Church St. to 1781 Hudson Terminal Building, 50 Church St. The telephone numbers of the New York office remain the same—2495-2496 Cortlandt.

Greenville, Ohio.—Residents of Darke County have been notified by the county fuel administration that there will be no hard coal available for burning this winter. Those who were depending on hard coal are therefore making different arrangements for their winter fuel.

Des Moines, Iowa.—Three million cords of wood will be cut in Iowa this fall for the winter supply, supplementing the coal supply of the state, according to figures announced by the state fuel administrator. This wood will take the place of at least a million tons of coal, it is said.

Huntington, W. Va.—October movements of Pocahontas coal amounted to 34,514 cars, averaging 53 tons per car, making a total of 1,829,242 tons shipped during the month. This constitutes the largest shipping record of the present year and has only been exceeded two or three times in the history of the field.

Cleveland, Ohio.—The C. O. Bartlett & Snow Co., manufacturers of tippie equipment, have closed their eastern branch, which was located at 50 Church St., New York. H. H. Bighouse, second vice president and chief engineer, who has been in charge of the eastern district, will hereafter be located at the main office of the company at Cleveland.

Vancouver, B. C.—The Canadian Northwest Steel Co. is building a fuel pulverizer, on plans prepared by the Fuller Engineering Co., for the British Columbia Sugar Refinery, of Vancouver, B. C. It is expected to cost about \$40,000. This is the first installation of the kind in the Canadian West, and, for that reason, is being viewed with special interest.

Pittsburgh, Penn.—Cost of insurance rating of miners was reduced 10 per cent. recently by the adoption of a new compensation insurance schedule, following a two-days' session at the Fort Pitt Hotel by representatives of the bituminous operators and the Pennsylvania State Bureau of Mines. The reduction in the rate is the result of the raise in wages.

Charleston, W. Va.—Installation of new 20,000-kw. generators at the plant of the Virginian Power Co., which furnishes power to mines in the Kanawha, New River and Winding Gulf fields, is now under way.

Upon the completion of the installation of new machinery and changes in the transmission system, the company will be able to meet all the power requirements in this territory.

Knoxville, Tenn.—At present prices of coal many small mines in Tennessee, along the Cincinnati Southern line of the Southern R. R., are finding it profitable to reopen operations. Several of these mines which have no rail connections are using motor trucks of 1½ to 2 tons capacity for hauling coal to the nearest railway siding, where it may be dumped into a loading hopper or shoveled directly into a car.

Cordova, Alaska.—The first shipment of Alaska coal to the states is expected soon to take place. It will consist of 1000 tons from the mines of the Alaska Petroleum and Coal Co. in the Bering coal fields. By early in 1919, it is believed, Cordova will be using Katalla coal exclusively. The coal is said to be a high grade anthracite and will be delivered on the Alaska coast much cheaper than coal can be imported from the states.

Linton, Ind.—The Indiana Public Service Commission has entered an order reducing the passenger rates on the miners' train operating between Linton and the Gould, Rose Hill, Ajax and Little Giant mines on the Monon R. R. The existing rate was \$2.75 a month and the new rate will allow the miners to purchase 54-trip commuters' tickets, good for 30 days, for \$1.50, or a 27-day ticket for 75 cents. The order is effective at once.

Urbana, Ill.—Prof. S. W. Parr, of the department of applied chemistry of the University of Illinois, has completed a series of experiments on coal carbonization which he has been carrying for some years. Prof. Parr says that the results show a possibility of changing Illinois coal into a smokeless fuel which would mean an opening for a new industry. The by-products of the carbonization of coal are also of interest and may have an important bearing upon the manufacture of gas for city and other uses.

Morgantown, W. Va.—Inability to obtain sufficient power has led operators of the Monongalia field to take preliminary steps toward having another power plant built in the field in order to relieve the situation. Discussion has led to having plans and specifications drawn up and to securing estimates as to the probable cost of a new plant. Mine owners operating in the Monongalia field point out that a new plant is a necessity because of the fact that production is being restricted by the difficulty in securing sufficient power to keep all mines going to their capacity.

Toledo, Ohio.—Considerable activity prevails at the lower lake ports as is shown by the record of loading at the various docks at this place. It is believed that the lake season will be officially closed Nov. 23, although the announcement is still withheld. During the week ending Nov. 9 the Hocking Valley docks loaded 160,491 tons, as compared with 140,564 tons the previous week, making a total of 4,795,060 tons for the season. During the same week the Toledo & Ohio Central docks loaded 72,000, as compared with 65,000 tons the previous week, making a total of 2,089,936 tons for the season.

Philadelphia, Penn.—A large brewery in the suburbs has volunteered to turn over for domestic use a large pile of No. 1 buckwheat coal. It appears that this coal was shipped to the brewery by a large operating company during the six weeks after Apr. 30, on which latter date the anthracite distribution authorities had ruled that no more buckwheat should be sold to manufacturing plants. The coal is offered to the public through the retail dealers, who will take orders for it and deliver to such consumers as may want it. As yet little demand has developed, but it is thought as the colder weather comes on every ton of it will be taken, as last year the dealers were unable to meet the demand for this size.

Frankfort, Ky.—Judge Sheckleford Miller of the Kentucky Court of Appeals has reversed a decision of the Muhlenberg Circuit Court, Greenville, in which the lower court cancelled a fifty-year lease held by the Continental Fuel Co. on 421 acres of coal land, and at the same time gave the property owners, J. C. Haden and Mrs. A. M. Bohannon, possession to \$100,000 worth of mining machinery on the company's premises. The owners of the property secured the cancellation on the ground of waste, but the higher court held that there was nothing to show that there had been any unnecessary waste in operation. The company was paying \$1500 annual rental. Besides spending \$100,000 for equipment it had spent considerable sums in fighting floods and protecting the property.

MARKET DEPARTMENT

Weekly Review

Lowered Production of Soft Coal Will Serve To Tighten Market—Large Stocks in Hands of Consumers Leads to Embargoes and Closing Down of Mines—Would Keep Alive Fuel Administration—Anthracite Situation Growing Worse

SORRY, indeed, would have been the status of the coal market at the present time if production for the months of October and November had been maintained at the high rate that prevailed during the latter part of September. During the period following Sept. 28 the output of soft coal has declined steadily, until we find that for the week ended Nov. 9 (the latest statistics available) the tonnage produced amounted to 10,409,000 net tons, which is considerably lower than the output for the corresponding period of 1917.

Instead of arousing consternation, this state of affairs has barely awakened the interest of the soft-coal consumer, who continues to preserve an apathetic calm in the face of warnings that a sudden cold snap, with the tying up of transportation facilities and the congestion of terminals, would militate against the possibility of the market becoming demoralized and bring about a lowering of prices. The continued decline in the output will have a decided tendency to tighten the market.

True, stocks of soft coal now in the hands of both dealers and consumers are larger than ever before in the history of the trade, but any number of things are likely to happen to remove this advantage. Strikes in the bituminous regions are not at all a remote possibility. Already murmurings of discontent are heard here and there.

Coal moving east from the Kanawha and New River fields of West Virginia, including even the coal used by the railroads themselves, has been embargoed owing to the congestion at tidewater. This means that the mines in these districts will have to close down. Thousands of mine workers will thus be forced into idleness. And when it is remembered that these very men were

only a short time ago working extra time to provide more and more coal at the behest of the authorities, it seems a harsh reward to lay them idle now.

This condition, unfortunately, appears to be one that it was impossible to avoid. In the New England States the signing of the armistice led to an aftermath of cancelled Government contracts, the suspension of orders for various materials, the elimination of night work and overtime, and in quite a few instances the closing down of entire plants. The industries thus affected, in order to prevent repetition of last winter's conditions (when they found it difficult to obtain an adequate fuel supply), this year overestimated their requirements and stocked up with coal accordingly. New England, therefore, now finds itself with a twenty weeks' reserve of soft coal, and is out of the market for the time being, if not virtually for the rest of the coal year. For this reason the embargo to tidewater ports was declared.

These extraordinary conditions prevail not only on the Atlantic seaboard, but in the Middle West as well. Many mines in Illinois were working only two or three days during the past week, and a number of operators report that they contemplate shutting down entirely as there is no market for their product. Naturally here too the mine workers are dissatisfied. Only the filling of orders for railroad coal keeps certain mines in the Middle West working anywhere near full time, and even the demand for this fuel is growing less vehement.

Operators are hopeful that the Government's program for the gradual transition of the country from a war to a peace basis will be carried out without any undue disturbance to industry, though the problems

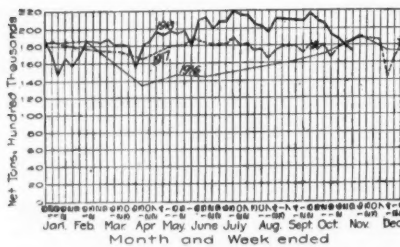
to be met are so complex in their nature that no one can truly say what unlooked for development the morrow will bring to light.

An earnest appeal has come from many factors in the coal industry that the Fuel Administration be kept alive at least until the end of the coal year if not for a longer period, instead of having its functions end with the signing of the peace pact, as provided by the terms of the Lever act. This would mean, of course, the maintenance of Government prices, the retention of the salient features of the zoning system, and the general control of the production and distribution of coal as in the months gone by. In its final analysis, this centralized control would undoubtedly work out for the best interests of all concerned. To restore the competitive features of the coal market at this time would work irreparable injury to dealers who have large stocks of unsold coal on hand, while the elimination of the zoning regulations would mean that coals from the east would again move to the interior and strangle local operations, as of yore.

During the week ended Nov. 9 the production of anthracite is estimated at 1,587,000 net tons, an increase of 87,000 net tons as compared with the week preceding. The total production of hard coal from Apr. 1 to Nov. 9 is estimated at 62,176,000 net tons, 704,000 net tons behind last year's output for the corresponding period. The steam sizes of anthracite continue to move slowly, while the efforts to supply the domestic sizes proves unavailing because the output of anthracite continues to grow steadily smaller. In the opinion of some operators it will be some time before sufficient hard coal will be mined to care for the normal demand.

WEEKLY COAL PRODUCTION

The downward trend of production of bituminous coal, which began after the record production during the week ended Sept. 28 when the output exceeded 13,000,000 net tons, not only continued through the week of Nov. 9 but brought the output during the current week, which is estimated at 10,409,000 net tons, below the production of the corresponding week of 1917, for the first time during the present coal year. It will thus be seen that the influenza epidemic together with the ob-



servance of election day, during the past week, and the celebration of the signing of the armistice, caused a decrease in the weekly production, during a period of six weeks, of over two and one-half million net tons.

The average daily production during the week of Nov. 9 is estimated at 1,735,000 net tons, as compared with 1,811,000 net tons during the week of Nov. 2, and 1,845,000 net tons during the corresponding week of last year. For the 1918 coal year to date, the daily average is estimated at 1,976,000 net tons, as compared with 1,758,000 net tons, and it is now necessary, under the budget as just revised by the Fuel Admin-

istration, to produce daily, during the balance of the coal year to make up for the past deficit, 2,034,000 net tons, 53,000 net tons, or approximately 3 per cent. In excess of the average daily production for the period Apr. 1 to Nov. 9.

The total production for the coal year to date is estimated at 379,364,000 net tons, as compared with 337,532,000 net tons during the same period of 1917, an increase of 41,832,000 net tons, or 12.5 per cent.

The holidays which further limited production of bituminous coal had no effect on the production of anthracite, the output during the week of Nov. 9 exceeding the preceding week by 87,000 net tons, or 5.8 per cent. The production of anthracite during the current week is estimated at 1,587,000 net tons, as compared with 1,500,000 net tons during the week of Nov. 2 and 2,041,000 net tons during the week of Nov. 9, 1917. The average daily production is estimated at 265,000 net tons, as compared with 329,000 net tons for the coal year to date, and as against 33,000 net tons during the same period of last year. Total production of anthracite from Apr. 1 to Nov. 9 is estimated at 62,176,000 net tons, 704,000 net tons, or 1.2 per cent. behind the 1917 production.

Carrier's reports for the week ended Nov. 9 show a falling off in shipments from all districts, with the exception of the district including Cumberland, Piedmont and Somerset, Fairmont, the district including northeast Kentucky and southern West Virginia, Tennessee and Kentucky and Alabama. No material gain was made in the districts reporting improvement, while material decreases were noted in Ohio, the district including Illinois, Indiana and western Kentucky and in the western and Rocky Mountain states.

Bituminous coal dumped at lake ports during the week ended Nov. 9 (including bunker), is estimated at 810,432 net tons as compared with 826,224 net tons, or a de-

crease of approximately 2 per cent. While the current week's tonnage is considerably below the weekly average from July 1 to date, it is nevertheless equivalent to the requirements as outlined by the Fuel Administration for this period of the year, and it is probable that even with the closing of the lake season as early as Nov. 23, the full budget, amounting to 29,500,000 net tons, will be met.

Shipments of bituminous coal to New England during the week ended Nov. 9 were 445,242 net tons and fell 7 per cent. below the shipments during the preceding week. Of this total, rail receipts, amounting to 139,968 net tons, exceeded the receipts during the preceding week by 17.6 per cent., while tidewater shipments, amounting to 305,274 net tons, fell behind the performance of Nov. 2 by 14 per cent. The decrease in tidewater shipments is attributed to the decline in tonnage loaded from New York and Philadelphia, the decrease from these harbors, this week compared with last, amounting to 34 per cent. Baltimore tonnage again exceeded the weekly average for the coal year to date, while all other harbors, as well as rail receipts were below this average.

Bituminous coal dumped at tidewater harbors during the week ended Nov. 9 is estimated at 791,071 net tons, a decrease compared with the week preceding of 3.5 per cent. This falling off was caused by a drop in shipments from New York, Philadelphia and Baltimore, with only a slight increase from Hampton Roads. Total tidewater shipments from all harbors for the coal year to date now amount to 28,423,226 net tons.

Beehive Coke—The production of beehive coke in the United States during the week ended Nov. 9 is estimated at 559,000 net tons, approximately the same as the week preceding, but 16,000 net tons or 3 per cent. below the corresponding week of 1917. The average daily production during the

current week is estimated at 93,000 net tons as compared with 96,000 net tons during the week of Nov. 9 of last year. The operators in the Connellsville, Greensburg and Latrobe districts of Pennsylvania report production during the week of Nov. 9 at 318,988 net tons, and the operation of their plants at 69.6 per cent. of full time as compared with 73.1 per cent. during the week preceding. The limiting factor was labor shortage, brought about to some extent by the celebration of Election Day and the signing of the armistice. The same operators produced 175,400 net tons of coal.

Byproduct Coke—The production of byproduct coke during the week of Nov. 9, estimated at 582,468 net tons, while slightly in excess of the week preceding, exceeded every previous week in history with the exception of the week of Oct. 5, when byproduct coke production reached the high mark of 585,281 net tons. The current week's production, however, exceeded the output during the same week of 1917 by 139,245 net tons or 31 per cent. Operating conditions during the week of Nov. 9 were slightly better than those reported for the week preceding, the plants of the country being operated at 90.2 per cent. as compared with 89.7 per cent. Repaired plants brought about the improvement which occurred, but still remained the real factor limiting production, the loss of full time attributed to that cause being reported at 5.8 per cent.

Operators in Alabama, Kentucky, Maryland and Ohio report an increase in production over the week of Nov. 2. In Alabama and Kentucky, the improvement is attributed to repairs to plants, in Maryland, to better labor conditions, and in Ohio to both. Material falling off in production occurred during the week in Massachusetts and New York, in the former state, necessary repairs to plants was the limiting factor while in the latter state both labor shortage and repairs to plants prevented greater production.

BUSINESS OPINIONS

Marshall Field & Co.—Current distribution of dry goods is somewhat less than for the corresponding week of 1917. The total of road sales for both immediate and future delivery also was less than for the same period a year ago. Fewer customers were in the house. Collections continue good.

Dry Goods Economist—In retelling jobbing and manufacturing circles the dominant topic of conversation is, of course, the new conditions created by the signing of an armistice. As yet, of course, there has been no increase in the quantities of different commodities available because of the changed conditions. But manufacturers of various lines of goods are giving voice to the opinion that increased production of commodities in which they are interested will result quickly.

The Iron Age—Shell steel and barbed wire contracts have been first to feel the making of peace. Other hundreds of thousands of tons of the former will be cancelled and the mills should soon be almost entirely through with that product. Some shell steel in the hands of the forgers may have to be diverted to other uses, if that is possible. The question of prices is having serious consideration. That they will come down is generally expected, and there is a strong sentiment in the industry for a continuance of conference relations between the War Industries Board and the manufacturers. Whether gradual reductions will stimulate buying is a question, but as there is no disposition either to buy or to sell on a large scale, that issue is not pressing.

American Wool and Cotton Reporter—The woolen goods market is taking the announcement of peace in a comparatively calm manner. With conditions as they exist, it is scarcely possible that any radical change can occur in the comparatively near future. Until the problem is worked out carefully, it does not seem possible for any great reduction in prices to occur, at least not enough to upset the quotations noted in secondary channels. Months ago it was generally believed that peace would be the signal for a radical increase in the cost of raw cotton. The idea at that time was based upon sound reasoning, but conditions have changed more or less radically, and while there is no great variation in opinion as to the long future, there is much less certainty as to what may happen.

Bradstreet's—Trade reports present varying aspects. On the one hand, there is repression, conservatism, uncertainty over prices, cancellations of orders with maneuvering to get out of others, and shaping of plans to pass from a war to a peace basis, but these factors intermingle with cheerfulness due to the virtual establishment of the world's freedom, with satisfaction over the lifting of long-imposed re-

strictions, as well as with tempered optimism that the process of switching from an all war-work program to normal activities will go forward with a minimum of shock. Thus far the great momentum attained by the war-propelled machine has prevented any abrupt changes, though overtime and Sunday work on government enterprises have been abolished, draft calls have been suspended, and it is evident that bids on many government contracts will not eventuate in actual awards.

Atlantic Seaboard

BOSTON

Market practically at a standstill. Buyers interested in peace readjustments rather than coal. Arrivals absorbed so far without great difficulty. Government cancellations a factor. Removal of stock limits has no effect. Combustion in storage a problem. Railroads cancel contracts. Box-cars now practically eliminated for bituminous to New England. Effective last week, the Fuel Administration ceased taking over wagon coal as "free coal." Average receipts all-rail on same level as week ago. Somewhat increased loadings at Hampton Roads, but outlet here much restricted. Dispatch good. New England Fuel Administrator dismisses large part of staff. Wage increases in Fairmont region. New through freight rates from the Baltimore & Ohio. Anthracite receipts continue only slightly less than a week ago. Local retail prices not yet fixed on receipts at advanced cost. Otherwise little comment on latter. Surplus of broken and pea continues.

Bituminous—The past week began what is certain to be a remarkable period of readjustment. Shippers are practically powerless to make arrangements for next season's business, the outlook as to price features is so uncertain. It is keenly realized that Government regulation has given us a maximum price, not a minimum; yet mine wages will probably have to be kept on the present level until there is more competition in the labor market or the cost of living is reduced. In the brief time since the armistice was signed there have been notable changes in a large number of industrial plants. Manufacturers in this territory who have supplied component parts of gas masks, for instance, are dismissing help by the wholesale. Meanwhile, this territory is said to have an average stock of 20 weeks, enough to take the edge off of any coal market next April and May.

Notwithstanding the general situation, there seems to be no great difficulty about placing what coal comes forward by water. Steamers pointed for Boston have been sent to Providence, and vice versa, but, at length, after more or less straining, the cargoes have been absorbed. Difficulties with trimmers at the various discharging berths have caused expensive delays, but shippers are now so well schooled in the situation that coal is not being loaded at the other end without having the disposition of the coal arranged for. One result of doing business on so close-hauled a basis is the difficulty of arranging for coal at the piers on short notice. It has happened several times lately that there has been active request f. o. b. New York, for this reason.

Even the railroads are now beginning to cancel contracts that call for monthly deliveries of staple coals that they have taken for years. It is only natural that the first moves of this kind are against deliveries by water. The high cost of water coal, the tonnage in reserve, and the general state of the market are considerations that will influence all kinds of buyers the remainder of the season.

Wagon coal, so far as New England is concerned, has practically ceased to come forward. It will be interesting to see whether wagon shippers will absorb the 75c loading charge for the sake of making sales. During last week the order of the fuel Administration effective July 22 was cancelled and box-car coal from the central Pennsylvania districts is no longer distributed through administration channels. The original reasons for taking over wagon coal as "free coal" are of course no longer operative, and the strenuous efforts that had to be made lately in order to place them in this territory only went to show how well-stocked is this section of the country. The Fuel Administration, and particularly J. P. Cameron, district representative of central Pennsylvania, are entitled to nothing but praise for the manner in which this troublesome matter was handled.

For the first 12 days of November the average daily receipts of bituminous at the New England gateways were 444 cars, commercial and railroad supply included. The average the past week has therefore been

practically the same as for the fortnight previous. It is probable that the balance of the month will show a reduction in movement.

Loadings at Hampton Roads have somewhat increased the past week, but this is not regarded as at all significant. Bottoms are being given better dispatch at both ends and are therefore making more regular trips. The outlet here is very much restricted, however, and the movement of boats calls for very careful planning on the part of the shippers. The fact that the New England Fuel Administration has practically withdrawn from active distribution makes it very much easier for ordinary agencies to lay their plans and carry them out. It was the constant interference with the usual channels of distribution that caused much of the heavy demurrage that New England consignees were called upon to pay during August and September.

Anthracite—Receipts all-rail of domestic sizes have fallen off about 20 cars per day since the first week of the month. Water receipts show a similar falling off. Invoices have now been rendered on which the advance shows, and cargoes have already been discharged on which the cost is on the new mine basis. Retail demand is still urgent in all the cities, and yet the retailers are granted no increase in price.

There continues the surplus of broken and pea in the hands of some dealers. And those two sizes are still in best supply at the New York piers. Stove and chestnut are still hard to get in any quantity. It is thought that retail prices will be arranged eventually to induce householders to take increasing proportions of these sizes.

PHILADELPHIA

Anthracite—Tonnage cut by celebrations. Family sizes very short. Some complaint of new prices. Steam sizes fall to gain strength. Looking to the future. Bituminous quite easy, although production reduced. Consumers demanding quality.

Anthracite—Loss of tonnage due to the armistice celebrations in the coal region featured the week. The city is now in an almost critical condition owing to the lack of family sizes. Normally cool weather has prevailed, making some fire necessary in the homes, but should a severely cold spell arrive there would surely be suffering among the improvident people who have made no preliminary arrangements whatever for their winter's fuel.

The largest retail concern in the city with yards in every locality, quotes the following rates for the last two weeks of the month: Egg, \$11.05; stove, \$11.45; chestnut, \$11.50; pea, \$9.60. Forty cents per ton is added to these figures when the coal cannot be chuted directly into cellars from the wagons or trucks.

All family sizes are now scarce. This is particularly true of chestnut, of which there appears to be none in stock in the yards. Stove is almost as short. Egg is easier only because a larger percentage of this size has been delivered to the consumers. Pea is the longest of the four sizes, but those who had stocks are alarmed at the rate the coal is being sent out.

No increase in the demand for steam sizes is reported and the recent shortage in production has been rather favorable to the market for small sizes. Buckwheat is reported as fairly free, so much so that retail dealers are at times being advised by larger shippers that they may have a car or two for domestic use. As yet the domestic demand for this size continues extremely limited and no particular activity is expected until the severely cold weather of winter arrives. Rice coal is but fairly taken, although the large users seem to be taking in large quantities of it despite the heavy stocks already in hand. A good deal of these sizes continues to go into the storage yards of the big companies. There is practically no spot business for barley. Cull is reported unsalable. These two latter sizes continue to be thrown on the banks by some shippers. The business of the river people is about done, at least for the present. There is also difficulty in keeping the washeries working and some of them are closed down.

That there will be marked changes in the coal business within the coming year no one doubts. The one ticklish point of the entire situation is the wages paid to the miners. These are strictly on a war-time basis and no one doubts that they must eventually come down, but the fear is expressed that when prices seek a normal level and it is necessary to retrench there will be trouble if any attempt is made to reduce wages.

Bituminous—While there is reported a reduction in bituminous production, there is no real shortage in this market. Enough coal is coming in to meet all demands, with the less desirable grades at times finding

themselves difficult to be moved. The market is distinctly taking on a quality trend and manufacturers are beginning to demand the grades they were accustomed to use in peace times. The car supply is sufficient to meet the needs of the situation and little complaint is heard on that score. There is much discussion as to the probable effect of discontinuance of the fuel administration, yet the general opinion in the soft coal trade seems to be that there should be no haste in this direction. This is distinctly a producers' opinion, for the brokers are strongly in favor of the retirement of the administration. They feel they have been practically eliminated by the war and are anxious to get back to the old-time basis.

There is much activity at tide, especially since there seems to be an easier market for bottoms, with all menace from enemy ships withdrawn. It is also rumored that there will be a greatly increased tonnage going over the piers soon for bunkering, inasmuch as a great deal of the bunkering of ships during the war has been done with foreign coal, which is expected to be withdrawn very soon.

NEW YORK

Distribution of the anthracite steam sizes receives attention as well as the lack of the domestic coals. Dealers well supplied with buckwheat and the smaller coals, while the consumer calls for the larger sizes. The outlying districts are receiving their supplies now. Bituminous producers and shippers looking into the future. Supplies here ample to meet all demands.

Anthracite—The distribution of the anthracite steam sizes is occupying nearly as much attention as the efforts to secure sufficient of the domestic sizes to meet demands. Reduced production due to the peace celebrations, lack of labor and the influenza epidemic have had a deterrent effect on the situation. Production continues to fall off, and in the opinion of some operators it will be some time before sufficient coal will be mined to meet normal conditions.

The demand here continues heavy. There has been a decided falling off in receipts while efforts are being made to take care of the needs of the outlying districts before transportation facilities are crippled by storms.

Instead of showing an improvement, as should be the case at this season, the dumpings at the local docks show a decrease of 742 cars for the week ended Nov. 15, 4255 cars having been dumped as compared with 4997 cars the previous week. This represents the tonnage handled for the territory taken care of by the local tidewater market and includes all sizes. A reflection of the decrease is seen in the production figures for the week ended Nov. 2, when there was a decrease of 12.5 per cent. in mining and a total of 29,223 cars shipped as compared with 32,033 cars the previous week.

Contrary to expectations there has been little criticism of the price increase, probably because it was authorized from Washington. The retail dealers in Manhattan and The Bronx advanced their retail prices 95c. per ton for the domestic sizes, while some of the dealers in Brooklyn increased theirs \$1.05, making the prices for chestnut coal \$11.30 per ton in that borough.

In spite of the reduced receipts the trade does not complain, but appears to take it as a "matter of course." Stocks are down to a minimum, especially on stove and chestnut sizes, broken, egg and pea are much easier, but dealers are not inclined to permit deliveries of either as a substitute for stove or chestnut.

In view of the lack of domestic coals and the abundant stocks of buckwheat No. 1 and the smaller sizes, State Fuel Administrator Cooke has issued suggestions for the use of these sizes especially buckwheat. In ordinary furnaces, in conjunction with domestic coals. The stocks of the small sizes in the yards of retail dealers are large and represent so much idle capital.

Current quotations, per gross ton, f.o.b., tidewater, at the lower ports are as follows:

Circular Individual		Circular Individual			
Broken..	\$7.80	\$8.55	Buck...\$5.10	\$5.90	
Egg....	7.70	8.45	Rice....	4.65	5.10
Stove...	7.95	8.70	Barley..	4.15	4.30
Pea..	8.05	8.80	Boiler..	4.60	
Cen...	6.55	7.30			

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates. Prices in buckwheat No. 1 and the smaller sizes of anthracite coal are not fixed by the Government.

Bituminous—The future of the trade is of considerable moment at the present time. With the almost shutting down of many

war industries and the curtailment of operations in many other industries, the trade realizes that unless there is a steady demand for fuel there will soon be an over-supply of coal, which would result in a further reduced production. One thing in their favor, they point out is the approach of winter and the possible rescinding or amending of the order regulating the storing of coal. The latter will open an avenue whereby manufacturers will be enabled to secure at the present time a goodly supply of fuel which may not be obtainable in a few weeks.

The surplus of commercial coals here is caused by the slowness of shipments to New England and the reduction of working hours in the many war industries located in the Metropolitan District. There are between 60 and 75 empty bottoms in the harbor awaiting orders that will take them to Sound points.

Current quotations, based on Government prices at the mines, net ton f.o.b., tidewater at the lower ports, are as follows:

	Mine Gross	F.o.b. N. Y. Gross
Central Pennsylvania:		
Mine-Run, prepared or slack.....	\$3.30	\$5.45
Upper Potomac, Cumberland, and Piedmont Fields:		
Run-of Mine.....	3.08	5.23
Prepared.....	3.36	5.51
Slack.....	2.80	4.95

Quotations at the upper ports are 5c. higher.

BALTIMORE

Bituminous situation tight except as to Government coal, which is here in abundance. Restrictions as to storage of coal lifted. Warning that control continues. Anthracite scarce. New prices in effect.

Bituminous—The situation for general bituminous supply here remains tight, as the coal trade has not altogether got over the effects of the influenza or the peace celebration. At Pool 13, which is the coal for local harbor use and largely on the account of the Maryland Fuel Administration for apportionment in the pool accounts of local jobbers as purchasing agents, there has been a scarcity noticed the entire week past. This is the more hurtful at present because many jobbers, still under the impression that they risk danger of losing accounts to mines by appealing direct to the fuel administration to have the needs of consumers filled, are refraining from filing such requests. Meanwhile there is an abundance of high grade coal still arriving on Government accounts for Pools 71 and 9.

The local fuel administration announced that the restriction on storage of coal, which held ordinary business to 15 days of coal and preferred industries to 30 days of coal, had been removed. Breweries and distilleries for the time will be allowed enough coal to protect plants from freezing, but not to operate.

Anthracite—Hard coal continues scarce here. Numerous complaints are being filed with the fuel administration by persons who have had orders on the books for months and who in many cases have received no coal at all.

Lake Markets

PITTSBURGH

Celebration greatly reduces production, bringing fresh distribution problems. No test of market's strength under peace conditions thus far.

The sharp curtailment in coal production in the Pittsburgh district due to celebration of the termination of hostilities has prevented any test occurring or the strength of the market. Many coal consumers entertained expectations that the end of the war would almost automatically bring about lower prices, and the weakness occasionally appearing in some Ohio markets seemed to lend color to the view. Such weaknesses were exaggerated in many quarters, for as a rule sales under the Government limits were of coal of quite indifferent quality. In the Pittsburgh market there has been at no time any material departure from Government limits. The test of the market is yet to come, however, on account of the greatly curtailed production due to the celebration. Many mines in the district were crippled badly throughout last week, and even at the beginning of this week the normal production rate was not fully restored. The coal industry was in sharp contrast with the iron and steel industry, which celebrated very fully on Monday, but resumed operations Tuesday morning at almost normal rate. The effects of the influenza epidemic are on the wane.

On account of the scarcity, practically no lake coal was shipped last week and the wind-up shipments planned will hardly be made at all. Supplies to railroads through usual channels were so restricted that many diversions had to be made by the local coal distributor to keep the railroads running, and even up to this writing there is far from being a surplus.

No important modifications of the coal zoning system have been made, and it is to the Railroad Administration rather than to the Fuel Administration that falls the task of modifying or eliminating the system if this is to be done. Predictions are made that the system will gradually be dropped, but it is pointed out that so many consumers have learned that they can well use other coals than they formerly demanded, involving shorter hauls, that the old alignment of distribution will never be restored even if artificial restrictions are eventually entirely removed.

The Fuel Administration fully intends to retain its control until the end of the coal year Apr. 1 next, at least. Its legal existence terminates with the peace proclamation, which will probably come at a later date, and legislation now being formulated at Washington for the general control of industry to set it firmly on its feet again on a peace basis may extend the Fuel Administration for a longer period.

The market remains quotable at the set limits: Slack, \$2.10; mine-run, \$2.35; screened, \$2.60, per net ton at mine, Pittsburgh district, brokers being allowed to charge 15c. additional.

BUFFALO

Plenty of bituminous. Same complaint of anthracite shortage.

Bituminous—The surplus of bituminous coal increases slowly. If the closing of the lakes takes place early, as is expected, the trade will have difficulty in disposing of the coal that is turned out. Already there is coal, some here, but more at certain Canadian centers, that cannot be sold; but it is said that as a rule it is of poor quality, which would find a very slow market at almost any time. The day when anything in the shape of coal was accepted is past.

Jobbers are encouraged. They are getting wires from operators, asking if they cannot sell a few cars for them. The main difficulty now is that it is no easy matter to sell coal anywhere, for the consumers are of the idea that the end of the war means a reduction of price. If they have any coal they are using it rather than buying more. It may be some time before buying is up to consumption.

Locally the situation is much easier than it was. The county fuel administration is not over-sure of the anthracite supply, but is able to announce that there is bituminous enough. If anthracite turns out to be short it is easy to buy other coal and get along. Some consumers are doing this, especially in Canada.

Anthracite—The supply shows no signs of increasing and so the consumer is complaining. He points to the fact that he has had his order in for some time and that it is unjust to ask him to pay an extra dollar per ton now. The movement to the lakes keeps up. Shippers say they do not expect to close down so long as they can get tonnage, for the supply to the upper lakes is not adequate, as is apparently the case with bituminous. No statement as to the condition of the anthracite in the lake trade has been made. There is a complaint of shortage, and the shippers are trying to get as much to the lakes as they can.

All stove and furnace sizes are short here and the local fuel authorities and others are advising consumers to put in a ton or two of pea or buckwheat, which are still plenty. It would not be easy to use these coals alone, but with a fair supply of ordinary sizes they can be made to go and at the same time save some dollars on a ton.

CLEVELAND

Bituminous continues to move into this district at a pace unchanged by peace developments. The period of readjustment appears to be rapidly growing more narrow and the bridging of it more easy than anticipated. Labor and car supply improving. Anthracite receipts have faded almost to nothing.

Bituminous—Cessation of hostilities, with the consequent slowing up of munitions making, in the lower lakes region, apparently has had no weakening effects on the local coal market. Opening of Michigan and parts of New York and Pennsylvania to Ohio operators has offset increased production, decreased lake trade requirements and lessened demand from those industries whose conversion from a war to a peace footing will be labored. Regular No. 8

coal has a market as wide as needed, operators assert.

Most operators agree with industry in general that the readjustment period will be less painful if Government regulations are swept aside immediately, and it becomes more apparent daily that efforts of Government officials to prolong the period of Federal regulation will fail signally. If industry is thrown on its own resources domestic requirements will engage production capacity for months, and an era of prosperity will result in which the coal industry will participate.

Operators continue to point to the wage problem as the governing factor in prices—back of Washington's effort to continue regulation is seen the Administration's attempt to maintain high wages as long as possible—and not until a decided cut is possible will coal prices recede much. Wagon mines are closing daily not to open again, under present circumstances, and it is believed that many properties producing low-grade coal soon will follow suit. Operators insist that any marked reduction in prices necessarily will compel closing of mines under the present high cost of labor. But surplus stocks of coal are not so heavy as generally believed, they hold, and no overproduction of high-grade coal is imminent.

Order books of the iron and steel industry of the lower lakes region, probably the largest single consumer of coal, are fast filling with domestic orders, which are being solicited, and shipments to these plants are continuing uninterrupted.

Retail dealers claim to be unable to buy the grades they now require at a figure under the maximum. Supplies are so plentiful for the domestic trade that customers are refusing to accept "dirty" coal, of a kind they were eagerly seeking six weeks ago. To market 3-in. lump bituminous has become a difficult matter, and retailers now are calling upon operators for—and are getting—1 1/2-in. lump. Quality and not quantity has become the watchword in the domestic trade. Domestic consumption has been reduced markedly by unusually mild weather, while the saving through a four-week ban on theaters, churches, schools and public gatherings is noticeable.

Influenza is on the wane in eastern and southern Ohio, resulting in improved labor and car-supply conditions. Shipments by members of the Pittsburgh Vein Operators' Association of Ohio in the week ended Oct. 31 totalled 8069 cars, compared with 4882 cars the first week previous, 5419 the second and 6103 the third.

Anthracite—Receipts have dwindled, and practically no market exists. The few cars of No. 1 buckwheat that filter through are hard to dispose of.

Lake Trade—The 2,300,000 tons of bituminous required by the Northwest to round out its quota of 28,000,000 tons will be floated by Nov. 23 without doubt. Loadings so far this month have proceeded at the rate of about 850,000 tons a week. After Nov. 23 special arrangements must be made with the Ore and Coal Exchange, Cleveland, for use of docks at both ends of the route. Duluth and Superior docks are reported filled, with labor restive and boats given slow treatment. Lake shippers in general are agreed that the pool of coal and vessel capacity this season has proved an unqualified success, and it is one war measure that both vessel interests and coal shippers hope will outlive the war. The Ore and Coal Exchange's revised and final statement shows that in October Lake Erie docks dumped 4,855,069 tons of cargo coal and 188,818 tons of vessel fuel, making a total tonnage of 5,043,887 for the month—a new high record. For the season to Nov. 1 the docks dumped 25,611,126 tons of cargo coal and 1,117,597 tons of vessel fuel, making a grand total of 26,728,723 tons.

DETROIT

Buying orders are fewer in both the steam and domestic branches of the coal trade in Detroit. Anthracite is not plentiful. Lake shipments are near the close.

Bituminous—There is a more conservative spirit apparent in the buying by users of steam coal and, also, on the part of retailers in the Detroit market. Neither class of buyers is displaying the interest and expressing the strong demands that were recently features of the local business. Instead, there is a general slowing down, and jobbers complain that they are meeting with considerable difficulty in hunting out buyers.

They believe the market has been surfeited with coal from Indiana and Illinois, sale of which was expedited by recommendations of the Federal and State fuel

administrations that buyers should assure a supply by taking any kind of coal that could be had. Manufacturing plants with storage space have set aside large reserves. Quite a number of them appear to have concluded their buying was overdone, and they are now shutting off on orders and using coal from their stockpiles.

Retailers who had stocked up heavily with anything in sight are not finding the relief they had expected domestic buyers to provide. The latter are proving somewhat critical. Weather conditions have not been sufficiently severe to create a strong demand from householders, and those who are in the market show a disinclination to take mine-run and coal from Indiana and Illinois, with which they are not familiar. Some of the coal from those states is reported unsold on tracks.

Anthracite—With only a small amount of anthracite in hands of local dealers, shipments are being held at a smaller volume than in October. The allowance of two tons first fixed as the maximum for owners of baseburners is to be increased to four tons, when additional supplies are available, according to announcement by the state fuel administrator.

Lake Trade—Quite an easing off in lake shipments is now under way, this condition reflecting a general suspension of lake shipments, which is expected to occur about Nov. 23. Movement of coal to loading docks is in smaller quantity than last month. Some of the vessels chartered in the coal trade are finding it necessary to go to two or more docks to complete loading and avoid delays in port.

COLUMBUS

Continued weakness is shown in mine-run and screenings in the Ohio trade. There is still a good demand for lump and other prepared sizes. The stopping of the war has caused a lull in the general demand for fuel.

The chief feature of the coal trade in Ohio is the weakness in the mine-run and screenings markets, which are badly overstocked. This is due largely to the stoppage of mine-run shipments to the Northwest and the cessation of orders because of the ending of hostilities. While prices have not been cut to any degree, still there are cases where the smaller operators have been shading quotations in order to get rid of stock on hand. The domestic sizes are in good demand although the warm weather has hindered the retail business. The tone of the trade is not so good as formerly.

Some mines in the Hocking Valley section have been closed because of the lull in mine-run, as many are not equipped to screen the coal. Others have been closed down by the Federal authorities in their campaign for clean coal. But despite the influenza epidemic and the lack of orders, production is still fairly good. In the Hocking Valley the output is estimated at 65 per cent. and in Cambridge and Crooksville about the same. Eastern Ohio is having a pretty fair car supply and the output has been about 70 per cent. of the average.

Domestic business is rather slow as the war weather has curtailed orders from consumers. Stocks in the hands of dealers are large. Mine-run is stocked pretty heavily, but dealers are not buying that grade. Considerable West Virginia coal is now on the market and dealers are stocking splints and New River. Pocahontas is entirely out of the market and the same is true of anthracite. Retail prices are firm at former levels, eliminating the jobbers' commission. Thick-vein Hocking has the preference over thin-vein grades.

Railroads are taking a good tonnage of steam grades, which helps to relieve the situation to a certain extent. Manufacturing plants have stocks to last from four weeks to four months and even longer, and there is not much demand under present unsettled conditions. The fact that the ban is raised on certain nonessential industries is expected to stimulate the steam trade.

The lake trade is still active, although it is getting close to the end of the season. It is understood that the last cargoes will leave the lower lake ports Nov. 23. This time may be extended. The strike in the upper lake ports has not affected the lake trade in Ohio to any great degree.

Prices for short tons at the mines in the Ohio districts are:

	Mine-Run	Prepared	Slack
Hocking thick vein..	\$2.50	\$2.75	\$2.25
Hocking thin vein..	2.90	3.15	2.65
Pomeroy Bend	2.50	2.75	2.25
Eastern Ohio	2.35	2.60	2.35

CINCINNATI

Continued limited production matches comparatively quiet demand. Transportation and labor conditions improving.

With the effects of the influenza epidemic still in evidence in the mining districts, according to reports received from several quarters, and with the lay-off which occurred on Nov. 11 on account of the general celebration of the cessation of hostilities, production of coal has not been at a high level. It has, however, kept pace with the current demand, which remains comparatively dull, except for occasional active spots.

There is in evidence something of a spirit of caution among manufacturers on account of the uncertainty of conditions following peace, but as a rule the trade does not anticipate that this will affect the demand for fuel to any considerable degree. The fact that coal will be needed for heating purposes and for all ordinary industrial operations almost without reference to the immediate effect of peace is generally taken to mean that demand will be at a normal rate, if not more so.

At the same time it is conceded that some of the extraordinary industrial activity which has been the direct results of enormous demands for war materials of various sorts will stop short, and that to this extent there may be a reduced demand for fuel. An easy market is expected by some, to last for the entire winter, barring weather of a severity paralleling that of last season, which is entirely improbable. So far, in fact, the weather has been remarkably mild, keeping consumption of fuel for heating purposes down to a lower volume than for several years.

LOUISVILLE

With exception of good grades of eastern Kentucky block coal the entire market is drabby and dull.

Jobbers and producers are generally up in the air as a result of the continued dullness of the market, coupled with the warm spell of weather, and further softening since the armistice was signed. Domestic coal, excepting the best grades of eastern Kentucky, is not in demand and the retailer is merely stocking his yard and marking time. The steam demand has been bad enough for some weeks past, but news of the peace agreement resulted in a further check in demand, as numerous industrial concerns cannot see much business ahead of them at the present time.

The jobbers and producers are having sleepless nights trying to figure out how and where to unload coal on hand. Some coal is paying demurrage, and other coal is being sold at below the market in order to keep things moving. Cars are plentiful, and labor supplies have been somewhat better since the influenza epidemic broke, with the result that many mines are getting more production that they can well handle, especially as every market in the country appears to be well loaded.

The steam consumer is playing a waiting game, and buying only what he has to have, feeling confidence in his ability to secure all necessary coal at future dates. Being uncertain relative to how long his business may be active if based largely on war orders he cannot afford to lay in coal. Again, price cutting has shown the weakness of the coal man's hand, and many consumers have about decided that they will buy coal at their own price before the winter is over.

As a whole the general market is in a very unsettled and bordering upon a serious condition. If the public needed help last winter and this year, the coal man appears to be the one who needs help this year. A good cold snap will probably help domestic business materially, but the steam situation is hard to figure out.

BIRMINGHAM

Local demand for steam coal only moderate. Domestic market continues stiff, with a great deficiency in the supply. Improvement in production slow, mine workers showing little disposition to work regularly.

Reports from local brokers and distributing agencies indicate about an even balance now between the demand for steam coal and the supply with which to meet such requirements. The market is in a little healthier state in that fewer cancellations of bookings were requested the past week than during the previous like period. The heavy drain on the output of the mines occasioned by 100 per cent. deliveries still being exacted on railroad contracts (which seem to be the only class of consumers without any stock accumulation), in conjunction with the depleted production of the past few weeks, has about equalized the conditions of supply and demand in a market which was showing indications of softness.

The need for domestic coal appears as acute as ever and inquiries are strong and insistent for this grade of fuel. The records of the Jefferson County Fuel Administration show that over 100,000 tons of domestic coal has been stored in the county since Apr. 1, which far exceeds any previous advance provision for winter fuel. Local dealers have little coal on hand.

Labor conditions at the mines are far from satisfactory, great indifference being manifested toward regular and steady work. Peace demonstrations demoralized mine workers for several days and resulted in a heavy loss in the output of coal. The output for the week ending Nov. 2 was 3437,557 net tons, or approximately 100,000 tons short of what should be produced by the labor engaged in this industry.

Coke

CONNELLSVILLE

Celebration further reduces output. Possibilities of market eventually declining below Government maximum prices. Consumers will seek concessions.

After several weeks of declining production of coke and shipping of raw coal in the Connellsville region, last week's celebration of the cessation of hostilities made further inroads on production and normal conditions may not be restored even this week. The steel industry confined its celebration almost entirely to the one day, Monday, and even on that day blast furnaces were kept going to an extent, so that the celebration curtailed coke production much more than coke consumption. While the Fuel Administration has been gathering statistics of stocks of coke at blast furnaces for some time, it is only within the past fortnight that any figures have been given out, and they show an average of about one week's coke in stock at furnaces. The stocks are so irregularly distributed that the recent curtailment in shipments is likely to cause some furnaces to bank for a few days.

For the longer future, the cessation of hostilities is likely to cause a decline in the coke market. During the recent curtailment in production on account of the influenza epidemic, which is now not much of a factor, some observers expressed the opinion that without the curtailment a softening of the market would have developed. Throughout the period of price control, to date, there has been practically no shading of the Fuel Administration's limit prices. This is now expected for the near future, and some consumers predict a decline of as much as \$1.50, which would make furnace coke \$4.50. Consumers will have a lever in negotiations, as there is the alternative of contracting for the first six months or the whole of 1919 or of buying from hand to mouth. It is held that while the set limits on coal are rather high, the limit price on coke is still higher, proportionately.

It is doubtful whether the Fuel Administration will set any minimum prices on coal and coke, although there is a possibility of the War Industries Board doing this in the case of pig iron and steel products. Its action might take the form of naming reduced maximum prices and allowing the producers to adopt the prices as minimum also, of their own volition, and the producers could probably work together. Coke producers have not in the past shown as much ability to work together as have iron and steel producers. Up to date, at any rate, the coke market remains quotable at the set limits: Furnace, \$6; foundry, 72 hour selected, \$7; crushed, over 3-in., \$7.30; clean screenings, over 3-in., \$5.50, per net ton at ovens. Foundry coke has been somewhat harder to sell of late, although there has been no shading, while the market for screenings is much reduced, there being better supplies of other kinds of domestic fuel at less cost. The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Nov. 9 at 279,650 tons, a decrease of 14,215 tons, and raw coal shipped at 193,837 tons, a decrease of 22,400 tons.

Buffalo—The demand eases off along with that for coal, furnaces no longer finding it hard to keep up a supply. It looks as if the prices fixed by the Government would soon be quite high enough, after so long being too low for any jobber to handle. Fuel coke is also much easier and may give way to bituminous so far as that will answer the same purpose. Iron ore receipts decrease slowly, on account of the lateness of the season, being for the week 297,744 gross tons.

Middle Western

GENERAL REVIEW

Market in a weak state. Operators fear that cancelling of war orders will wreak havoc for a while. Outlook for next year optimistic.

Opinion is expressed that there will be a sharp break in the market. The industries, even in this Middle West district, which have been engaged in filling war orders will find their orders either cancelled outright or curtailed to a minimum. This, of course, will force an additional tonnage of free coal on the market when the market is least able to absorb it.

The public have practically satisfied their requirements and manufacturers have enough coal on hand to last until Jan. 1, 1919. The railroads, apparently, are not interested in coal. Add to this grave situation the fact that hundreds of thousands of tons of coal formerly absorbed by "war industries" will be thrown on a market, weak almost to the point of panic, and you will have a fairly good idea of the problem facing the average coal operator.

Some operators believe the only way to avert, if such a thing is possible, the debacle in the coal market is to abolish the present zoning system, with its accompanying rules and regulations; but whether the abolition of the zones would help matters is a question worthy of grave consideration.

It is only the immediate future that worries the coal man. That conditions will gradually improve is the opinion of nearly all operators. This country will have to undertake a vast program of reconstruction work, and it is generally believed that once this work has begun the demand for coal will improve and strengthen, until the demand is as great as in 1916 and 1917. Some of the best informed men connected with the coal-producing industry maintain that the demand for coal for 1919 will be greater than ever before experienced.

CHICAGO

Mild weather still continuing, few orders are placed for steam or domestic coal. Steam coal being sold below Government maximum.

The mild weather still continues, and few orders for either steam or domestic coal are being received. The big users of steam coal are bending all their energies toward reducing their various storage piles. The reason for this is obvious, as an unprecedented number of fires have originated within the last three weeks in various storage piles placed about the city. The idea in the mind of the average purchasing agent is to burn his own storage pile underneath his boilers, rather than lose his coal or have his coal deteriorate through spontaneous combustion. This development has naturally kept a large number of Chicago coal users out of the market.

Steam coal can be purchased from practically all fields at a substantial reduction from the price set by the Government. The domestic situation continues dull, with little or no demand, and there is no change to be looked for until cold weather sets in.

MILWAUKEE

The coal situation is satisfactory as far as supply is concerned. Little fear of a fuel famine. Receipts by lake slowing up some.

In striking contrast with this period a year ago, there is little agitation in Milwaukee over the coal supply, and it seems to be the general opinion that there is no danger of a fuel famine during the coming winter. With the two-thirds supply clause affecting all anthracite orders of more than six tons, the general campaign of fuel saving, and the pleas of officials to substitute soft for hard coal, the administrators think it probable that all consumers who cannot burn anything but anthracite will be supplied in full. Deliveries are now on a more satisfactory basis, and the prevailing mild weather contributes to make the lot of the coal man more serene.

Prices continue on the schedule which has prevailed for weeks. The advance of \$1.05 on anthracite mined since Nov. 1 will not be experienced here, as there is little chance that any of this coal will reach these parts. At best the quantity would be light.

Receipts of coal by lake are slowing up somewhat, and unless there is a spurt during the last half of November, the month's figures will be the lowest since the opening of navigation. Thus far this

month 56,277 tons of anthracite and 102,742 tons of bituminous have been taken over the docks, making the season's record up to this writing 616,246 tons of the former and 3,253,871 tons of the latter. As against last year's record this shows a loss in anthracite receipts by lake of about 20 per cent, and about the same percentage of gain in bituminous. About a month of navigation remains. Rail receipts of hard coal continue fair and serve to help out the delivery situation, as the coal is transferred direct to wagons and trucks.

ST. LOUIS

Market is utterly demoralized on Standard coals. Many mines shut down on account of no business and nothing in sight. Mt. Olive market slowly but surely breaking and Cartersville coal a drug on the local market. Steam and domestic both affected and no country business. Cars plentiful, transportation good and unusually mild weather.

The local situation continues a discouraging one for the coal trade. The weather at this time is milder than in most years, and there is absolutely no coal moving except what is being put in storage by the dealers at greatly reduced prices and the regular steam trade that has to have coal on account of having no great storage facilities.

The Standard market is utterly demoralized. Screenings are going at practically anything the buyer will offer, and this usually means about \$1.50 to 1.60 on good coal. Two-inch lump coal is down to about \$1.75 to \$1.85 and hard to move at that. Not only is the domestic trade stopped, but the steam business has fallen off nearly altogether. Steam plants are using up their storage coal.

Many mines in the Standard field have been working only two or three days in the past week and now contemplate shutting down for one or two weeks straight. There is much dissatisfaction among the miners over this. The only mines that are working anywhere near full time are those working on railroad coal, and this tonnage has been shut off at some places in the past week, closing these mines down entirely. The influenza is letting up in the Standard field and miners are now returning to work, throwing an additional tonnage on the market.

In the Mt. Olive field conditions are not so bad as those in the Standard districts, but they are rapidly coming to it. Mt. Olive coal for the first time in over a year is selling at below the Government maximum for domestic sizes. The steam market is still holding fairly well on this, but it is by extremely hard work. The tonnage of railroad coal in this market still continues to move, but it is questionable as to how long it will continue.

The Henrietta mine at Worden is expected to shut down the coming week indefinitely on account of labor troubles and lack of market.

In the Cartersville district the mines are beginning to show a surplus of domestic coal. No mines have been idle as yet on account of no orders, but some mines have had coal unbilled in the evenings.

There is no fear that this coal will go below the Government price, but it is going to be somewhat of a task, if this weather continues, to move all of this tonnage in the next week or two.

As far as the south is concerned, this coal is a drug on the market. St. Louis has more than it can use and the southern territory for the first time in many months has a chance to get some of this coal, but is gradually reporting that it is overloaded.

Car supply is plentiful, movement is good, and miners are returning to work here, as in the Standard field.

It is going to take good, cold weather to stimulate the southern Illinois market. There are no outside coals coming in and no demand for any. The retail market is holding fairly well except on Standard, which is suffering a cut of 50c. a ton.

The wholesale prices are, with the exceptions, as noted:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump...	\$2.55@2.75	\$2.55@2.75	\$2.40@2.70
3x6-in. egg...	2.55@2.75	2.55@2.75	2.40@2.70
2x3-in. nut...	2.55@2.75	2.55@2.75	2.40@2.70
Washed:			
No. 1.....	3.05@3.20	3.05@3.20	.....
No. 2.....	3.05@3.20	3.05@3.20	.....
No. 3.....	3.05@3.20	3.05@3.20	.....
Mine Run...	2.35@2.50	2.35@2.50	2.20@2.30
Screenings...	2.17@2.32	2.17@1.32	1.50@1.60

Special preparation on Cartersville is 10 cents extra. Williamson & Franklin Co. rate is \$1.10. Other fields 95 cents.